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A STUDY OF HIATAL HERNIAS, USING PNEUMOPERITONEUM

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ACCURATELY evaluating upper abdominal symptoms when there is radiologic evidence of a diaphragmatic hernia, is a perplexing clinical problem.[1] For several years after the advent of modern surgical technic, hiatal hernias were repaired in large numbers, frequently with no clinical improvement. This caused surgical repair to fall into some disrepute, with a number of clinicians and radiologists stating that radiologic evidence of a hiatus hernia was of no clinical significance in most cases.

During the past few years there has been a reawakening of interest in the problem. It is becoming clear that many persons have suffered from this condition, living for years on ulcer diets or being considered essentially an emotional problem, after repeated studies revealed no organic lesion other than a hiatus hernia.[2] The concept that if most hiatus hernias observed roentgenographically are asymptomatic, all are asymptomatic is not necessarily true. It is highly probable that a number of hiatus hernias do produce symptoms, which frequently may be very distressing. The clinician must decide if the patient's complaints are due to a hiatus hernia diagnosed by roentgenography or to some other cause.

Symptoms due to an esophageal hiatus hernia frequently mimic those of a wide variety of upper abdominal and chest diseases.[3] Methods to relieve the symptoms of hiatus hernia have been nearly as diversified as the symptoms themselves. The use of diets, antispasmodics, antacids, and special sleeping arrangements have all given from fair to poor results in general. The most successful method is surgical repair of the hernia, but the physician is hesitant to recommend this uncomfortable, slightly

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hazardous form of therapy unless he is reasonably confident that the operation will relieve the symptoms. At this hospital a group has been investigating a procedure which may enable a physician to more accurately ascertain if the presenting symptoms are due to an esophageal hiatus hernia. Pneumoperitoneum[4] has been used. In approaching this problem, patients whose symptoms were believed to be caused by hiatus hernia were selected after careful clinical and roentgenographic evaluation. The purpose of this study was to test the effect of pneumoperitoneum in patients in whom the clinical diagnosis was relatively well established. If intra-abdominal air produced relief in a high percent of selected patients with symptomatic hiatus hernia, it would be useful as supporting evidence in cases in which a definite opinion could not be arrived at on other grounds.

Candidates for this study were questioned as to type of symptoms, duration, intensity, and related conditions. Particular interest was paid to recumbent pain and regurgitation. Previous medical therapy such as diet, drugs, and other methods to control the pain was evaluated. These patients were then examined with an esophagoscope for esophagitis and herniated gastric mucosa, and to observe the action of the cardia. In patients with suspected hiatus hernia, careful roentgenographic examination of the upper gastrointestinal tract was carried out to establish the diagnosis and to rule out the presence of other organic disease. During fluoroscopy several maneuvers were used to distinguish the type of herniation, if one was found. Esophagogastric junction was observed in the upright position and in the supine and prone Trendelenburg while the patient was drinking barium water mixture. Increased intra-abdominal pressure was used to determine the presence of regurgitation. This finding was observed in the majority of those patients complaining of symptoms attributed to an esophageal hiatus hernia. Esophagograms were obtained on all patients, and an attempt was made to evaluate the distal end of the esophagus, the type of herniation, and the presence or absence of peptic esophagitis. Identical procedures were carried out on each patient following pneumoperitoneum, and the examination was repeated after surgical repair of the herniation.

The preparation of the patients selected for pneumoperitoneum was extremely important. Each patient was informed as to the symptoms, if any, which might be produced by the air and asked to differentiate them from his previous complaints. Pneumoperitoneum was begun by injecting about 300 cc. of air under pressure ranging from 25 to 40 cm. of water into the abdominal cavity by means of an aneroid pneumo apparatus. Forty-eight hours later a larger amount of air was injected in a similar manner, the average volume being between 500 and 800 cc. The precise amount of

air injected on each occasion depended partly on the musculature of the abdomen, degree of relaxation, and discomfort produced.[5] Forty-eight hours following the second injection, between 750 and 1,000 cc. of air was given intra-abdominally, making a total of between 1,500 and 2,000 cc. of air over a 4-day period. At this point the patient was asked to begin recording any changes in his symptoms. At three 5-day intervals thereafter about 750 cc. of air was injected in order to maintain an average pressure in the abdomen of about 10 cm. of water. During the 2-week period following the initial three injections of air, the patient's symptomatology was evaluated. The patient's hiatus hernia was then surgically repaired. These patients were observed postoperatively for from 3 months to 1 year. In the 10 patients who have been studied to date, symptoms were improved with pneumoperitoneum in 9; in 4 the response was very dramatic. The procedure was not tolerated in the tenth patient. All 10 patients showed postoperative clinical improvement which closely correlated with the degree of improvement gained by the pneumoperitoneum. Three typical cases are described.

CASE REPORTS

Case 1. A 37-year-old man had moderately severe recumbent distress unaffected by diet or drug except that spicy foods exaggerated his symptoms. A rather large esophageal hiatus hernia was noted by roentgenography. Esophagoscopic examination showed a moderate esophagitis. Over a 3-week period the patient was given 3,000 cc. of air intra-abdominally which gave complete relief. He was then operated on, and during a 6-month postoperative follow-up he has remained asymptomatic.

Case 2. A 55-year-old man entered the hospital complaining of burning epigastric pain occurring postprandially and at night. He obtained moderate relief by assuming an upright position and walking about. The patient had a myocardial infarction several years previously, and continued to suffer from angina pectoris. Over a 15-day period 2,300 cc. of air were injected into the patient's abdomen. During this procedure the patient continued to have exertional angina, but noted disappearance of postprandial and night epigastric burning pain. Operation was performed, and the results in the 8 postoperative months have been good.

Case 3. A 28-year-old man suffered severe postprandial distress and had lived for 18 months almost entirely on milk. Repeated thorough evaluations of the patient's upper abdomen and chest revealed only a hiatus hernia. The patient had been considered a psychoneurotic prior to this study. Over a 3-week period, 3,000 cc. of air were injected into the abdomen, producing complete relief of his symptoms. Physical results were also excellent, and there has been no recurrence of symptoms a year postoperatively.

The mechanism by which relief is obtained is not entirely clear. We believe that pneumoperitoneum reduces the hiatus hernia a sufficient number of hours during the day to allow irritation and pressure to subside, so that considerable, if not com-

Figure 1. A sliding type hiatus hernia visualized prior to pneumoperitoneum.

plete, relief is obtained. Repeated roentgenograms showed that, while sufficient air was present under the diaphragm, the stomach did not protrude through the hiatus while the patient was in the upright position (figs. 1 through 4). In a number of patients in

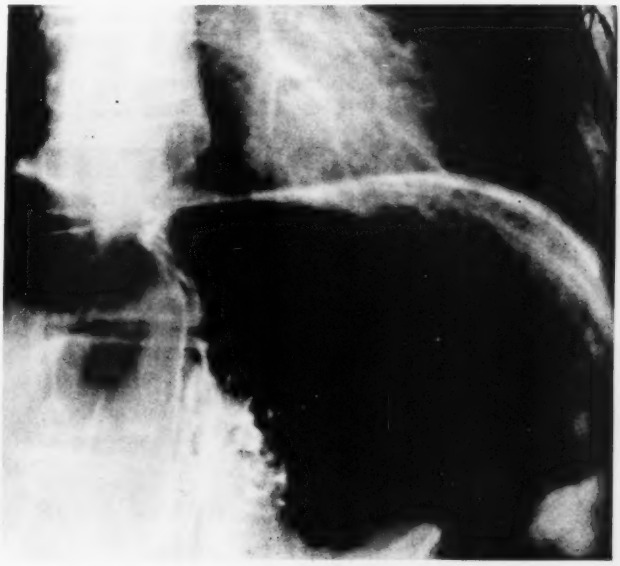

Figure 2. Roentgenogram of same patient as in figure 1, showing reduction of the hiatus hernia with pneumoperitoneum.

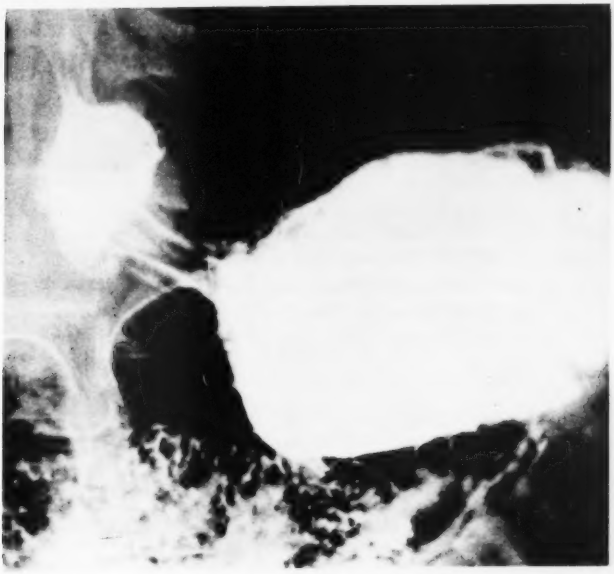

Figure 3. A sliding type of hiatus hernia visualized prior to pneumoperitoneum.

the Trendelenburg position the stomach herniated through the diaphragm just as was observed before the injection of air.

In conclusion, it is believed that this method simulates reduction of the hernia, anticipated by surgical repair, and that

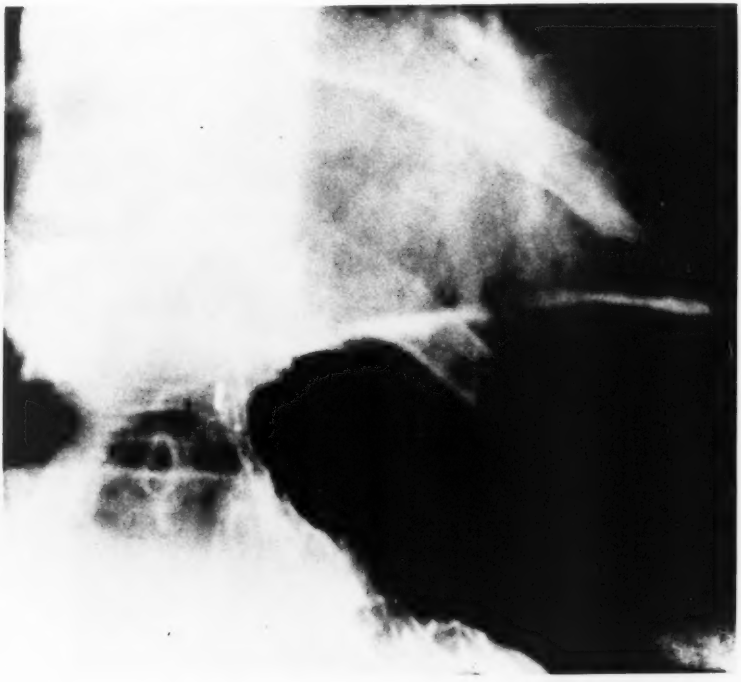

Figure 4. Reduction of a sliding type hiatus hernia in the upright position with pneumoperitoneum. The metallic clip visualized was placed at the esophagogastric junction during endoscopy.

it might well be a useful technic for selecting patients who will benefit from surgical intervention.

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EXPERIENCES WITH THE ACUTE PHASE OF POLIOMYELITIS

A Clinical Study of 118 Cases

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ONE HUNDRED AND EIGHTEEN patients (service personnel and their dependents) with poliomyelitis were admitted to this hospital during the period from December 1953 through November 1954. A clinical analysis of the cases and an evaluation of the results of therapy in the 1953-1954 poliomyelitis epidemic in the Territory of Hawaii are presented here. The classification used here is a modification of that of Grulee[1] and Smith and associates.[2] The frequency of these cases by type of poliomyelitis is shown in table 1.

TABLE 1. *Frequency of the different forms of poliomyelitis*

Type	Number of cases	Percent
Nonparalytic	39	33.1
Encephalitic	5	4.3
Bulbar	21	17.8
Spinal	53	44.8
Total	118	100.0

CLINICAL FEATURES

Signs and symptoms. All patients admitted in the acute phase of the disease had fever. The six predominant complaints, listed in order of frequency, were headache, fever, muscle soreness, muscle weakness, symptoms of upper respiratory infection, and nausea and vomiting. Muscle weakness and/or muscle soreness occurred in 90 percent of the patients at some time during the acute phase of the illness. Urinary retention was present in 14 patients on admission. The duration of symptoms prior to hospital admission is summarized in table 2. About one half the patients were adults. The onset in the older patients appeared to be more insidious, the acute phase more prolonged, and the

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pain in the limbs and back more pronounced than in the younger age group. In the older age group the dromedary form, characterized by two distinct bouts of fever, was seen infrequently. There was little if any correlation between the length and severity of the initial symptoms and the final outcome of the disease. Many of the patients with nonparalytic poliomyelitis had prolonged

TABLE 2. *Duration of symptoms prior to admission to the hospital*

Duration (days)	Number of patients
1 or less	15
2 - 4	66
5 - 7	23
8 or more	14

and severe initial symptoms while many of the patients with paralytic poliomyelitis had mild symptoms. In the average patient the fever lasted from 5 to 9 days. Here also there was no direct correlation between the degree of fever at the time of onset and the type or severity of the disease. Eleven patients (9 percent) had paralysis on the first day of fever. The onset of paralysis in one patient occurred on the first day after the temperature had returned to normal, and on the second day in another.

Spinal fluid findings. Spinal fluid examinations were performed on all patients on admission or soon after. Ten cells or less per cubic millimeter in the spinal fluid were considered a normal finding. The spinal fluid cell count on admission ranged from 2 to 900 per cu. mm. (table 3). There were 11 patients who had a cell count of less than 10 on the initial examination. Of these, three were clinically past the acute stage, and all three had an elevated spinal fluid protein. Of the remaining eight patients, seven had elevated cell counts on repeat examinations. There were 33 patients who had a cell count greater than 150 per cu. mm. The spinal fluid protein value ranged between 15 and 120 mg. per 100 ml. (table 4). In five of our seven patients with a severe form of the disease, the fluid on initial examination early in the acute phase of the disease revealed a high cell count and a high total protein concentration, *i. e.*, a cell count greater than 100 per cu. mm. and a protein greater than 100 mg. per 100 ml. This finding was not present in the remaining 111 patients. The cell count in relationship to the severity of the disease is summarized in table 3.

Age and sex. The largest number of cases, comprising about 47 percent of all admitted patients, was in the 1- to 10-year-old group (table 5). The youngest patient was 5 months of age, and

the oldest was a 50-year-old man. (A detailed breakdown by age is presented in table 5.) The ratio by sex was 3 to 2, with males predominating.

TABLE 3. *Spinal fluid cell count in relationship to severity of poliomyelitis*

Type of poliomyelitis	Cell count per cubic millimeters				
	Less than 10	10 - 50	51 - 150	151 - 300	301 - 900
Nonparalytic	1	13	14	10	1
Spinal					
Mild	1	10	13	6	1
Moderate	-	4	4	5	3
Severe	-	-	2	4	-
Bulbar-encephalitic	2	8	13	3	-
Total	4	35	46	28	5

TABLE 4. *Spinal fluid protein in patients with acute poliomyelitis*

Spinal fluid protein (mg. per 100 ml.)	15 - 40	41 - 80	81 - 120
Number of patients	57	53	8

TABLE 5. *Age group of patients with poliomyelitis*

Age group (years)	Number of patients
Under 1	6
1 - 5	29
6 - 10	20
11 - 15	3
16 - 20	7
21 - 30	36
31 - 40	16
Over 40	1

Seasonal incidence. The peak incidence of poliomyelitis in the Territory of Hawaii has varied from year to year but has usually occurred in the spring months. In the 1953-1954 epidemic the peak was in March (table 6). From our small series it appeared that the virulence of the disease was greatest early in the epidemic. The majority of our severe and moderately severe

cases occurred in the first 12 weeks of the epidemic. In December 1953, there were 12 patients admitted with acute poliomyelitis. Of these, two had respiratory paralysis and in four others the disease was of moderate severity. The extent of involvement in the patients admitted in January and February 1954 was similar to that in those admitted in December. By March 1954 the virulence of the disease was decreasing and 11 of the paralytic patients had mild involvement.

TABLE 6. *Incidence of acute poliomyelitis by months*

Month	Cases		Total
	Paralytic	Nonparalytic	
1953			
December	10	2	12
1954			
January	11	4	15
February	12	2	14
March	19	2	21
April	5	2	7
May	7	1	8
June	9	7	16
July	2	8	10
August	1	5	6
September	1	3	4
October	1	2	3
November	1	1	2
Total	79	39	118

Deaths. There were two deaths in the group of 118 patients. Considering only the 79 paralytic cases, the fatality rate was 2.5 percent. If we consider only the 14 respirator cases, the mortality rate was 14.3 percent. The two patients who died were 29 and 31 years of age, respectively. Both had severe bulbar spinal type poliomyelitis.

MANAGEMENT

The following is a résumé of the therapeutic regimen at this hospital during the 1954 epidemic.

Nonparalytic poliomyelitis cases. These patients were treated with bed rest, standard hospital diet, and hot packs for relief of muscle pain and spasm two to four times daily. The constipated patients were given milk of magnesia and enemas every other day as required. In addition, they received daily physiotherapy. Five days after the patients became afebrile they were transferred to the orthopedic service for further evaluation.

Spinal poliomyelitis cases. The patients with spinal poliomyelitis were treated similarly to those with the nonparalytic form of the disease. Urinary retention, if present, was treated by the use of an indwelling catheter and irrigations with potassium permanganate solutions three or four times daily. The indwelling catheter was removed in 3 to 4 days, and usually recatheterization was not necessary. Prophylactic antibiotics were given while the catheter was in place. Hot packs gave relief of muscle pain and spasm in the majority of patients. Aspirin occasionally helped the remainder. Foot drop was corrected by the use of a footboard.

Bulbar poliomyelitis cases. Patients with mild bulbar poliomyelitis were treated much the same as the patients with the nonparalytic form of the disease except that their diet was of a liquid nature. If they had difficulty in swallowing, they were given about 2,000 ml. of fluids intravenously daily until their temperature returned to normal, when nasal gavage was begun. Initially, the feedings were small, consisting of only 2 or 3 ounces of fluid. The amount was gradually increased over a period of several days to the point where the patient was receiving from 10 to 12 ounces every 4 hours. These gavage feedings contained about 1 calorie per ml. If respiratory difficulty was present, a tracheotomy was performed and the patient was placed in a respirator. The patients with respiratory difficulty were given penicillin or, if allergic to penicillin, erythromycin and streptomycin combinations.

Poliomyelitis patients with respiratory muscle paralysis. A number of simple clinical tests were used to determine presence of breathing difficulty. The length of time the patient could hold his breath or the duration of phonation was a rough index of the momentary reserve. Ability to cough proved a good index of function of the laryngeal, diaphragmatic, and abdominal muscles. The vital capacity measurement was also useful.[3] It was our practice to consider a patient with weakness of the respiratory muscles in need of artificial respiration if the vital capacity dropped to 25 percent of the predicted normal. If the patient had appreciable impairment of the diaphragm, used the accessory muscles for breathing, or complained of air hunger, and there were other symptoms of exhaustion, vital capacity readings above 25 percent did not contraindicate the use of respiratory aids. After an elective tracheotomy was performed, the patient was placed in the tank respirator and he became a nursing problem under close medical supervision. Tracheotomies were performed in 13 of the 14 respirator patients as an elective procedure. The fourteenth patient was an emergency case because of the ad-

vanced respiratory distress on admission. The respiratory rate and the negative pressure maintained in the respirator were such as to produce the required tidal volume as predicted for the patient. For the average adult the rate was set at 16 to 18 cycles per minute and the negative pressure was maintained at −15 to −17 cm. of water. Particular attention was given to thorough training of the nurses and the hospital attendants in the correct procedures of caring for patients in respirators. In both training and practical application, emphasis was placed on maintenance of an adequate airway, gentle removal of secretions in the trachea by suction, maintenance of correct pressures within the respirator, and emergency technics for manual operation in the event of a power failure.

During the febrile stage the patients received adequate fluids intravenously. When they were afebrile they were given a high-calorie diet with vitamin supplements. Penicillin was administered daily, and streptomycin was given twice weekly. Hot packs were used to relieve muscle spasm and pain, unless the rectal temperature was greater than 102° F. Gastric dilatation was watched for and treated with a stomach tube as the condition presented itself. Pressure ulcers were prevented by the frequent turning of the patient.

The patients were routinely coughed three to four times daily within the respirator. A negative pressure of from 35 to 40 cm. of water for adults and from 25 to 30 cm. of water for children was obtained by inserting a vacuum hose from a tank type vacuum cleaner into a porthole.[4] When the desired negative pressure was obtained, the bedpan port was rapidly opened and allowed to remain open for another complete cycle. The procedure was repeated for six coughs after which the patient was allowed to rest for 5 minutes. The series of coughs were repeated three times, three to four times daily. If there was evidence of atelectasis or pneumonia, the patient was given aerosol therapy using alevaire (brand of a detergent, superinone) (brand of crystalline trypsin) prior to the coughing procedure. During the short rest periods between the series of coughs, secretions were removed through the tracheotomy tube with the usual aspiration apparatus and a No. 10 French urinary catheter.

After the patient became afebrile he was removed from the respirator for short periods by using the Bennett portable intermittent positive pressure machine. The respirations were carried on by manually tripping the machine 16 to 18 times a minute under a positive pressure of 16 to 18 cm. of water. The use of the Bennett portable intermittent positive pressure machine greatly facilitated the removal of the patient from the respirator for nursing care and positional change. Adequate minute volume was maintained during this procedure.

Muscle tonus and vital capacity were checked periodically. After the patient was afebrile and the vital capacity had improved to about 30 percent of the predicted normal, he was removed from the respirator for short periods, once or twice daily, gradually increasing the time out of the respirator. He remained in the respirator for sleeping at night until he tolerated at least 6 hours continuously out of the respirator during the day. If he was still unable to cough he was returned to the respirator temporarily for the procedure. It was noted that when the vital capacity reached about 50 percent of the predicted normal the coughing strength was usually sufficient to clear the tracheobronchial tree. After the patient had been weaned from the respirator and could cough satisfactorily, the tracheotomy tube was removed. Prior to removal, however, the tube was plugged for from 5 to 7 days to check for difficulty in handling secretions.

DISCUSSION

All six of our patients under 1 year of age had paralysis on admission. The diagnosis was confirmed by spinal fluid examination. There were undoubtedly many cases of nonparalytic poliomyelitis missed in children under 2 years of age.

The frequency of nonparalytic poliomyelitis was highest in the younger age groups, constituting 37 percent of all cases of poliomyelitis in the 1- to 10-year group and 40 percent in the 11- to 20-year group; whereas it was 25 percent in the 31- to 40-year group, and 30 percent in the 21- to 31-year group.

The Hawaiian peak incidence in the spring, rather than late summer as occurs in the mainland, may have been due to the mild weather experienced here throughout the year.

The decision as to whether or not exhaustion due to respiratory impairment exists in a given patient was at times controversial. However, in the patients with respiratory muscle paralysis it was thought safer to err on the side of using artificial respiration early. This avoided sudden adverse changes in the patient's condition due to impairment of the airway, rapid progression of weakness of the muscles of respiration, or decrease in the functioning lung tissue because of atelectasis and pneumonia. Elattner[5] recently listed the criteria for the clinical determination of types of breathing difficulty.

There have been considerable differences of opinion as to the indications for tracheotomy.[2, 3, 6] It was our practice to do tracheotomies in those patients that showed progression of the bulbar signs plus respiratory inadequacy as well as where there was obvious impairment of the airway by paralysis and accumulation of secretions.

There were 26 cases of the bulbar encephalitic type of poliomyelitis, of which 7 were very severe and 6 moderately severe.

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It was our thought that the mortality was reduced by placing these patients in a respirator as soon as indicated. Tracheotomy was performed as an elective procedure, thus avoiding the necessity of an emergency operation. When severe ventilatory failure is present, the emergency tracheotomy is technically difficult. We believed that the tracheotomy tubes provided a better means of removing the secretions and that they facilitated the use of the combined respiratory pressures. The use of the positive pressure early in the disease helped prevent pneumonia and atelectasis, especially in the more severely involved cases. Although the Bennett intermittent positive pressure apparatus could be used with a mask, it was more fatiguing to the patient and heightened his apprehension more than when the intermittent positive pressure was used through the tracheotomy tube.

We found that the frequency of negative spinal fluid findings was lower than that reported in most series of cases.[2, 7, 8] This may have been due to the repeated examination, because the percentage of normal spinal fluids on the initial examination was similar to that in other series.

SUMMARY

Of 118 cases of poliomyelitis involving military personnel and dependents during the 1954 epidemic in Hawaii, 33 percent were nonparalytic, 22 percent were bulbar-encephalitic, and 45 percent were spinal. The over-all mortality rate was 1.7 percent.

This series was similar to others reported except for the seasonal incidence and spinal fluid findings. About 7 percent of the patients showed no pleocytosis or increased spinal fluid protein on admission; however, this was decreased to less than 1 percent on repeated spinal fluid examinations.

The length or severity of the prodromal symptoms had no bearing on the final outcome of the disease, and the virulence of the disease was greatest early in the epidemic.

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MANAGEMENT OF PSYCHIATRIC PROBLEMS BY THE DISPENSARY PHYSICIAN

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THE BELIEF that we create problems by exploring the psychologic reactions of our emotionally disturbed patients is like ascribing the cause of a fever to the thermometer.[1] Further, to avoid a psychiatric problem when it exists is to fail to take the temperature of a patient because we fear we will be unable to cope with his fever.

Modern medicine is dedicated to the ultimate goal of alleviating discomfort. With the exception of the antibiotics, there are few, if any, medicines that effect a complete cure. Even with surgical removal of diseased parts, there is not complete restoration to anatomic normality. Despite the presence of the residual abnormality (scar tissue), the practitioner is satisfied when functional homeostasis is obtained. Too often when we are confronted with psychiatric problems we rationalize our frustrations over the failure to initiate a channelization of a therapeutic regimen by referring the patient to a specialist for the "cure." Psychiatric medicine, however, is also geared to diminishing discomfort, with few opportunities for eliciting a complete cure. We cannot dispel our frustrations by rationalizing that psychiatric problems are infrequent. Indeed, it has been variously estimated that from 40 to 80 percent of patients seen by the general physician are suffering from symptoms directly related to emotional problems.[2,3] In view of the shortage of psychiatrists, the first-echelon physician has the responsibility of recognizing and managing these problems, which are real and frequent.

The need therefore arises to consider how best to use the armamentarium at the disposal of the general medical officer. The purpose of this article is to aid the dispensary physician (1) in deciding which patients he can and should handle; (2) in planning a program for the management of these patients; (3) in deciding which patients should be referred (and to whom); and (4) in preparing patients for referral to a psychiatrist. By necessity, the depth and the scope of this discussion is limited;

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it does not deal with research, and makes no attempt to teach psychotherapy or discuss in detail the problems of individual patients. The suggestions made are general, and it will be noted that some are inapplicable to combat situations.

For convenience, this article is organized around the following diagnostic categories: (1) Schizophrenia and depressions (the two most frequently seen and perhaps most confusing of the severe mental illnesses); (2) psychoneuroses; and (3) character and behavior disorders.

SCHIZOPHRENIA AND DEPRESSIONS

Schizophrenia. It is a simple diagnostic task to recognize an overt schizophrenic reaction with classical symptoms such as: hallucinations, delusions, illusions, stereotypy, short attention span, circumstantiality and irrelevancy of speech, bizarre ideation, feelings of unreality, and complete intellectual dysfunction. It is more difficult, however, and just as important, to recognize the incipient or early schizophrenic. The schizophrenic process is a disease characterized early by the withdrawal of emotional life from reality. It is only later in this continuum that the intellectual dysfunctions and thinking disorders become clinically prominent. The schizophrenic is ever trying to diminish his discomfort by reducing emotional contact with the people who he believes have hurt him. The schizophrenic has feelings and emotions, but they are expressed inappropriately, symbolically (gestures, grimaces, posturing), or suppressed entirely (apathetic and blunted affect). By consulting members of the man's unit, we can learn something of his emotional reaction to others. But right before us we have an index as to how the soldier reacts emotionally. How does this patient respond to the interviewer? How does he react to humor? Are his verbalizations incompatible with the emotional tones expressed? Does he appear to be at the same emotional level at all times, apparently expressing a paucity of emotion? Although schizophrenia is a syndrome, the affective reaction of the patient is the most important single characteristic.[4] It should be noted, however, that cultural differences between patient and physician should be considered (*e. g.,* a Caucasian, northern-born physician may misunderstand the emotional reactions of a southern-born Negro; an American-born physician may misinterpret the reactions of a foreign-born patient). Talking with a confrere of the patient who is in his unit and of similar cultural origin often mitigates this confusion.

Depressions. Patients are often referred to the psychiatrist for "depression" when in fact they feel "blue" or unhappy. Psychiatrically, depression implies that the patient is seriously ill and must be considered a possible suicide risk. The differ-

ence between the symptom-complex presented by the neurotic and that of the psychotic depressive is a quantitative one. However, the neurotic depressive may be conscious of a recent traumatic event; the psychotic, not so. A severe neurotic depression may develop into a psychotic one. Some of the features which suggest depression are initially vague somatic complaints, especially constipation, insomnia, anorexia, restlessness, impotence, and the inability to cry. Psychomotor retardation and feelings of severe remorse, self-reproach, and guilt are cardinal symptoms. Often after an interview with this type of patient the feelings of hopelessness of the patient may be felt by the physician so that he too feels dejected.

Any patient showing affective signs or symptoms of an incipient or full-blown schizophrenic reaction or of a severe depression should be referred to the psychiatrist for further evaluation.

PSYCHONEUROSIS

Grinker[5] has stated, "Psychoneuroses are the result of conflicts between opposing inner psychological forces or between certain drives within man and his restricting, frustrating or punitive environment." Whether the environment is, in actuality, threatening or is only perceived as such by the psychoneurotic person often determines the course of management. What may appear to be a neurotic problem can, in reality, be a situational one. Or the psychoneurotic person can actually be in a threatening environment. In both cases environmental manipulation should be attempted. If he perceives the environment as dangerous when it is not so, psychotherapy is the treatment of choice. The avenues of relieving external stress are discussed later.

The physician can use psychotherapeutic technics to minimize the internalized conflicts of his patients. However, before the physician can successfully undertake psychotherapeutic approaches, he must first understand that "the therapeutic results of labeling a man a 'goldbrick' are harmful . . . . An attitude of impatience or disgust always delays and sometimes prevents adequate treatment . . . ."[6] Of paramount importance to successful psychotherapy is a good relationship between patient and physician. The fact that the latter is an officer has its advantages in establishing confidence but it also can be a disadvantage, depending on how it is used. Authoritative acceptance has a positive effect; authoritarian control has a negative one. The physician must have a sincere desire to help, sympathy for the patient and his problem, and an appreciation of the positive personality characteristics of the man entrusted to his care. At the same time he must have introspected sufficiently so as not to impute his own feelings to the patient. Objectivity is

important. Whitehorn[7] suggested that the therapist consult another physician, not necessarily a psychiatrist, so that objective orientation may be maintained. The consulting physician may point out when the therapist or the patient appears to be resisting therapy and when mistakes of over-identification are made. The consultant, with objectivity twice-removed, often has other interpretations to offer which can be of value. A psychiatric authority has expressed another basic qualification of the therapist, namely, "the ability to listen."[8] It is the person with the problems (presumably the patient!) who has the need to talk.

Initially, the physician must approach the patient with the attitude of "how can I alleviate the prevailing discomfort" and thus establish and limit his goals of therapy. For example, a soldier had minor personality problems but functioned adequately until he had an acute episode of anxiety. Exploration revealed that the soldier recently had a sexual experience about which he felt extreme guilt. The physician in this case set for himself the goal of relieving the man's feelings of guilt, and when this was accomplished the patient's anxiety was diminished. The dispensary physician helped this soldier achieve psychologic and functional homeostasis without "curing" his patient of all his problems.

In the management of psychiatric problems the physician, as he would in any field of medicine, must familiarize himself with basic therapeutic approaches. Levine's[9] book on psychotherapy in medical practice is especially noteworthy. Some of the more commonly applied psychotherapeutic approaches which are often used in combination are:

1. *Explanative*. This approach often relieves the fear of the patient that he is suffering from a severe or incurable illness. In addition, it assures the patient that the doctor is interested and does not consider the symptoms "imaginary."

2. *Supportive*. These technics are aimed at encouraging the patient by pointing out his accomplishments and potentialities. *Reassurance* is a supportive technic whereby a patient's confidence is restored by pointing out forms of satisfactions in his past life; whereas *suggestion* aids the patient in discovering new areas of satisfaction. Accepting the patient while he ventilates pent-up hostile feelings is another form of support. This technic has the additional benefit of helping the patient formulate the advantages and disadvantages of certain decisions without direct advice from the physician.

Case 1. A soldier became severely agitated shortly after having a mole removed from his nose. Prior to this, he had felt that he was ugly, stupid, and disliked. The removal of the mole focused his sensi-

tivity onto his face. The patient ventilated freely his resentment of his father who regarded him as "dumb and worthless." While accepting the patient's hostile feelings, the therapist pointed out the soldier's success as an athlete in high school and reassured him that he was at least average in appearance and intelligence. The patient was encouraged to continue his college correspondence courses. During the course of the treatment, the patient began "dating" and new areas of satisfaction increased his feelings of security.

3. *Deeper forms* of therapy (uncovering, interpretative, et cetera), unlike the explanative and supportive types, attempt to uncover unconscious problems, destroy inadequate defenses, and rebuild new mechanisms of defense. This therapy, which often involves exploration of early childhood, dream analysis, and free association technics, is usually the task of the specialist. However, occasional interpretations that are understood by the patient and the physician and that do not mobilize anxiety may reveal insights and thus be constructive.

It is not within the scope of this article to discuss somatic manifestations of neurotic problems. Psychosomatic medicine basically "concerns itself with the psychologic approach to general medicine."[1] "It is both a special field and an integral part of every medical specialty."[10] Alexander's[11] book is highly instructive concerning the meaningful function of somatic symptoms. It discusses at length the modern concepts of such psychosomatic illnesses as peptic ulcer, hypertension, hyperthyroidism, asthma, ulcerative colitis, et cetera.

It is a well-known fact that the process of referring a mildly psychoneurotic patient to a psychiatrist may result in the eventual fixation of symptoms.[12] In the time lag between referral and consultation the patient may come to feel that he is "crazy," or "mysteriously" ill. In general, any one of the following situations is an indication for referring a psychoneurotic patient to a psychiatrist: (1) When the patient has symptoms which have been intractable to ordinary forms of medical management and psychotherapeutic approaches; (2) where the neurotic problem is well established, and the patient is functioning inadequately and appears motivated for more intensive forms of treatment; (3) when the problem is severe enough for special care (*e. g.*, hospitalization); and (4) when the dispensary physician believes that the dynamics of the problem are too obscure for him to understand.

Case 2. A 23-year-old soldier was referred to a psychiatrist from the medical inpatient service because of a midepigastric pain, episodic in nature, which had persisted for 8 weeks and which necessitated hospitalization (intractable, severe, special care necessary—see (1) and (3)). Routine medical studies failed to reveal an organic basis

for the disturbance. Explanative and supportive therapy were to no avail. Repressed hostility toward parental figures and a past history of peptic ulcer and asthma suggested a rather chronic, well-established neurotic pattern. This patient was well selected for referral to the psychiatrist for exploration of possible unconscious dynamics. The patient had been married 6 months. His wife had written letters in which she told of her pregnancy and complained of cramping sensations in the abdomen. The patient readily discussed his identification with his wife and her symptoms. He was able to accept the interpretation that his symptomatology was related to hers. In discussing his dreams he noted that his wife was always present but never pregnant. Hostility to the unborn child (who would divert his wife's attention from the patient) was not taken up directly in therapy. A program was arranged with the medical department whereby the patient could sublimate repressed hostility feelings through physical therapy. Further psychiatric interviews revealed that the patient gradually became free of his epigastric distress.

CHARACTER AND BEHAVIOR DISORDERS

The Joint Armed Forces Nomenclature pamphlet, which lists, differentiates, and describes psychiatric conditions as found in the service, defines character and behavior disorders as " . . . characterized by developmental defects or pathological trends in the personality structure, with minimal subjective anxiety, and little or no signs of distress. In most instances, the disorder is manifested by a lifelong pattern of action or behavior ("acting out"), rather than by mental or emotional symptoms."[13] It is often difficult to clearly distinguish between neuroticlike behavior in the character-behavior disorder, and psychoneurosis, psychosis, or situational maladjustment. A thorough social history contributes to making distinctions.

The history of the patient with a character and behavior disorder, as distinguished from that of the neurotic person, primarily shows continuous difficulty in making a sustained adjustment. In addition, he appears to be unable to profit from experience. Positive personality features and average or superior intelligence may aid in good initial adjustment. The distinction between a patient with a mild character and behavior disorder (*e. g.*, a passive and/or dependent person) and a neurotic person is not important because results from brief psychotherapy can be extremely helpful for the patient with mild character disorder and gratifying for the physician.[14] It is only when the character-behavior disorders are severe that distinction is pragmatic (the management of these cases is discussed later).

A past history of severe maladjustment may indicate that the soldier has had previous psychotic episodes. Questions should be asked concerning past hospitalization and such treatment

as electroshock and insulin shock. However, even though the patient may not give a history of past psychosis "it is . . . quite likely that the pre-existing psychopathy (character and behavior disorder) may facilitate the development of some of the mental diseases."[15] Therefore, an examination of the patient's mental status is in order to rule out the existence of a present psychotic illness, even in the presence of a history compatible with a character-behavior disorder.

The person suffering from a situational maladjustment, unlike one with a character-behavior disorder, has difficulty adjusting to "newly experienced environmental factors or to especially trying and difficult situations, with no evidence, however, of any serious long-standing or underlying personality defects or chronic neurotic patterns."[13] Anxiety, alcoholism, asthenia, poor efficiency, or low morale may be manifestations. It should be noted that, if unrelieved, these reactions can result in psychoneurotic- or psychopathic-like reactions.[13] The management of these situations involves working with the environment (manipulation) or directly with the patient (morale-building).

Our first consideration here is environmental manipulation. As the mental health adviser, the dispensary physician is justified in exploring a patient's interpersonal difficulties within his unit which may have resulted in psychologic discomfort to his patient. The man's company commander or his first sergeant can be interviewed to ascertain if interpersonal conflicts can be relieved. If, through discussions, it is not possible to solve interpersonal problems, and the physician believes that the man can make a better adjustment in a new job or a new unit, the physician should certainly make such recommendations.[16, 17]

Some problems of morale also may be classified as manageable through environmental manipulation. The tensions may not be due to problems within the unit, but may be caused by concern over family matters "back home." The soldier should be informed of Red Cross facilities for finding out facts about the home situation. Morale leave or compassionate transfer may be indicated. Such soldiers should be referred to the chaplain, not to the psychiatrist whose primary function is the diagnosis and treatment of mental illnesses.

There are some soldiers who are in need of morale-building and moral-support, *e. g.,* the recruit who says, "The Army is not doing anything for me." It can be pointed out, sympathetically albeit realistically, to this man that the Army is not supposed to do anything for him, and that his presence in the Army is in fulfillment of an obligation to his government. It can be emphasized that if his experience in the Army is to be of benefit to him he must take the initiative in exploring educational and

entertainment facilities as well as those of special services. The chaplain often gives invaluable aid to the soldier who is in need of morale-building, group or religious activities, or help with certain marital problems.

The psychotherapeutic management of patients with more severe character-behavior disorders is a difficult task. Any of the therapeutic technics previously discussed may be attempted, with ventilation being perhaps the most effective. Certainly this in itself is not remedial, but ventilation " . . . often results in relief from anxiety and resentment, and lessens the need to act out emotional conflicts in a socially undesirable manner."[18] However, it is in treating the patients with a severe character-behavior disorder that supportive psychotherapeutic approaches most often need to be combined with environmental manipulation.

Case 3. A 40-year-old alcoholic who had been in the service for 14 years was sent to the psychiatrist for "cure" of his alcoholism. It was brought out in the initial interview that this man was in a line outfit competing with soldiers 15 to 20 years his junior. He continually suffered blows to his self-esteem when the younger men referred to him as "Dad" or "the old man." In a case such as this, where alcoholism is a habit pattern developed over the years, the only realistic approach is to relieve, if possible, the stress conditions so that alcoholic intake may be diminished. A transfer to a less threatening environment was recommended. This case illustrates a need for a kind of environmental manipulation that can be better evaluated by the physician in the dispensary because of his closer proximity to the problem.

Psychiatric referral of the patient with character and behavior disorder is indicated when the dispensary physician has been unsuccessful in the management thereof, yet believes that the patient is motivated for treatment and that more experienced handling may be beneficial. If the possibilities of management (intrinsic and extrinsic) have been explored, and the physician is of the opinion that the soldier will not respond to further efforts but instead is likely to be more threatened (and as a result a more severe problem to the Army), administrative separation should be recommended. Patients who have acted-out repeatedly in an asocial or antisocial manner and appear to be heading for disciplinary actions can be released from the service under the provisions of Army Regulation 615-368 ("unfitness"). Soldiers who, despite efforts at reclassification and reassignment, appear unable to adapt but who have not been severe problems are released administratively under the provisions of Army Regulation 635-209 ("unsuitability" or "inaptitude"). When these conditions prevail, the dispensary physician has the authorization, and should take the responsibility, for writing a certificate recommending administrative separation. He should include in the

statement that (1) the patient is able to distinguish right from wrong and to adhere to the right; (2) he possesses sufficient mental capacity to understand the nature of any proceedings against him, and intelligently to conduct or co-operate in his defense; and (3) there is no mental or physical disability present that is sufficient to warrant separation from the military service through medical channels.[19, 20] It is not absolutely necessary for the physician to indicate whether the man should be separated under Army Regulation 615-368 or Army Regulation 635-209. It will suffice merely to recommend "administrative separation under appropriate provisions." The relationship between the dispensary physician and the company commander certainly is enhanced when the medical officer takes this responsibility without referring it to a psychiatrist who actually has less knowledge of the factors at hand.

PREPARATION FOR THE REFERRAL

As important as the recognition of the need for referral to the psychiatrist is the preparation of the patient for the referral. Before the referral is made, the physician must understand that personal motives may affect the reason for his decision. Hostile rejection of the patient who has mobilized the physician's anxiety may result in a punitive measure, which finds outlet through a psychiatric referral. An aid to the physician in understanding his own motives is writing out questions on the consultation sheet that he desires to have answered; *e. g.*, a question of differential diagnosis, a question of whether or not supportive technics are sufficient to alleviate the patient's presenting complaints, and other questions referring to the management and disposition of the given problem. The way in which the preparation is handled has a significant effect upon the attitude with which the patient comes (or refuses to come) to the psychiatrist as well as upon the illness itself. The implicit or explicit use of such terms as "psycho," "schizophrenic," "crazy," or "shock treatment" carries serious adverse emotional impacts. A surreptitiously arranged referral will destroy the confidence of the patient in both physicians. An attempt to conceal the identity and the purpose of the consultant by referring to him as a "nerve doctor" rather than as a psychiatrist "serves to reinforce the patient's need to believe that his illness is organic and has no connection with his inner personal self or his intimate feeling toward significant people in his life."[21] At the same time, efforts should be made not to overrate the coming interview by promising the patient a cure.

The referral should be handled in a simple, honest, direct fashion, indicating that the psychiatrist is an accepted, respectable physician as is any other specialist. No embarrassment need be attached to the fact that the physician thinks that the

patient has emotional problems. Bond and Flumerfelt[22] suggested beginning in this manner: "I think the symptoms you have may be very largely related to some of your problems and I think you should go to someone who is more familiar with dealing with such things than I am." A brief explanation of how people react physiologically to conditions of emotional stress should be made (*e. g.*, the somatic manifestations of fear). The fact that the referring physician is concerned about the patient's symptoms helps dispel the doubt that "it's all in your mind," or "just psychological." The patient should be prepared for the fact that in order for the consulting physician to understand his emotional feelings, intimate and personal questions will be asked. The referring physician can leave the patient with the final feeling that should he not be treated by the psychiatrist for any reason, he is not a "forgotten case" but can return to the referring physician for help following the psychiatric consultation.

SUMMARY

As a general practitioner, the dispensary physician has the right and the obligation to allay discomfort in his psychiatric patients. The prevalence of psychiatric problems and the shortage of psychiatrists obviate any other course. The psychiatric patient presents a confused clinical picture and the channelization of a therapeutic regimen is often obscure. This article attempts to offer suggestions for the diagnosis, management, and referral of psychiatric patients. The psychotherapeutic and environmental manipulative devices existing in the general medical officer's armamentarium are explored.

It is important to evaluate the affective reactions of the early schizophrenics. Unit contacts and the patient's reaction during the interview aid in this evaluation. Psychiatrically depressed patients who are serious suicidal possibilities display various degrees of some symptoms which are listed. Explanative, supportive, and interpretative approaches, although superficial, may be helpful to some neurotic patients.

Persons who are suffering from certain situational difficulties may be helped through the Red Cross, the chaplain, and morale-building interviews, or through the development of better relations with men in their unit. Patients with mild character and behavior disorders may be approached psychotherapeutically the same as a neurotic person. When soldiers with severe character and behavior disorders appear to be heading for increasing difficulties, the first-echelon practitioner should take the initiative and recommend administrative discharge.

Psychotics, depressives, or patients suffering from psychoneurotic disorders which are intractable, chronic, or severe

should be seen by the psychiatrist, as should any other patient whose problem appears too complex to be approached through ordinary methods. Finally, as important as the actual psychotherapy of patients by the dispensary physician is the preparation of other patients who are to be referred to the psychiatrist. Simple, frank, and direct explanation of the need for this referral is recommended.

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DIAGNOSTIC RADIOGRAPHY WITH RADIOACTIVE ISOTOPES

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MOBILITY is basic to modern concepts of warfare. Because of the emphasis on mobility, under field conditions the medical service must frequently sacrifice certain equipment which is taken for granted in permanent military or civilian hospitals. Diagnostic x-ray facilities, for example, are usually available only in rear areas because the equipment is heavy, relatively fragile, and requires specialized supporting facilities such as electric power sources, darkrooms, et cetera.

A lightweight, rugged, completely portable radiography unit which would operate independently of sources of power and specialized equipment offers obvious advantages for military and civilian disaster usage. Localization of metallic foreign bodies such as shell fragments, the diagnosis of fractures, and the less dramatic but equally valuable application to patients observed at medical and dental sick calls are a few obvious uses for such a unit.

Over the past 2 years the Army Medical Research Laboratory has devoted considerable effort to the development of a practical, completely mobile diagnostic x-ray unit. A workable model which weighs less than 50 pounds and which will operate under field conditions without specialized equipment has now been developed. Because the radiation is emitted by a radioactive isotopic source, no electrical generators, wiring circuits, or control panels are required. The radiographic films may be developed in a "self-contained" cassette or film holder, and no solutions, water, or darkroom are required.

There are two mechanisms by which the impingement of electrons on the target material produces x-rays. The first mechanism is by the production of what is known as "characteristic" x-rays. Normally the atom is in a stable state. If one of the high energy electrons from the electric discharge across the vacuum tube crashes into the stable configuration of the atom there is a certain low probability that it will eject one of the satellite electrons from its orbit by "collision" (probably interference with the

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electric field). When such an ejection of an electron occurs the atom has an unstable configuration. If the electron was removed from one of the inner orbits its place will be taken immediately by an electron from an outer orbit which moves in to replace it. In moving in, however, this electron goes from a higher to a lower energy state. By the laws of conservation of energy the difference in energy cannot be lost, and in this case it is emitted as an electromagnetic radiation of proper wave length to be classified as an x-ray. In other words the energy of the x-rays are a characteristic of the target and are therefore called "characteristic" x-rays.

The second mechanism of x-ray production results from *bremsstrahlung* or "braking radiation." In this case the incident electrons, on entering the electrical field of the target atoms, are slowed down and eventually stopped without necessarily "knocking out" any orbital electrons. These fast-moving incident electrons have considerable energy which must be given up in being brought to a stop. This energy may appear as heat, light, or as x-rays. Because the electrons do not all have the same initial energy, do not all enter the electrical field of the target atoms in the same way, and are not all decelerated in the same manner, the resulting radiations show a wide variation in energy, from very low to very high, with the maximum being limited by the energy of the incident electrons.

The higher the energy of x-rays the greater is their penetrating ability. Energy is usually expressed in thousands of electron volts (kev) or millions of electron volts (mev). X-rays with an energy of several hundred kev are able to penetrate a considerable thickness of steel and are frequently used in industry for the radiographic study of castings, welds, et cetera. Such highly energetic radiation is entirely unsuitable for medical diagnostic use, although it is of value in radiation therapy. Medical radiography is dependent on the fact that when x-rays of suitable energy are made incident on a body part there is a differential degree of absorption of radiation by various structures which is related to the density of the structure. If the energy of the radiation is too high, then it is almost equally penetrating for all tissue structures and no contrast is obtained on the radiographic film. If the energy is too low it does not penetrate tissue sufficiently to be of practical value. For most diagnostic work, x-rays ranging in energy from about 30 to 100 kev are used. The first criterion, then, for useful diagnostic x-rays is that their energy lies somewhere in the range of 30 to 100 kev.

The image cast by a structure on a film is somewhat analogous to the shadow cast by an object in front of a light. If a spotlight is used as a light source then the shadow has clearly defined margins. If a diffuse source of light, such as a bank of fluorescent

bulbs, is used then the shadow is poorly defined and has blurred margins. A similar situation holds for radiography. When the radiation source approximates a point (small "focal spot") good definition is obtained on the film or fluoroscopic screen. When the radiation is emitted from a large area the definition is poor. It follows, therefore, that the second criterion for a useful diagnostic radiation source is that the radiation be emitted from an area which approximates a point. The third criterion for a good source is that a sufficient number of x-rays be emitted per unit time and that the total exposure time for taking a radiograph be reasonably short.

PRINCIPLES OF ISOTOPIC RADIOGRAPHY

It can be surmised that even with refinements, conventional x-ray equipment is likely to remain heavy, relatively fragile, and dependent on sources of electrical power for its operation. All these factors tend to limit mobility. If a source of radiation were available which fulfilled the above criteria for useful radiography, but which did not have the objectionable features of x-ray machines with respect to mobility, then a practical radiographic apparatus for use in advanced field units could be developed. Such radiation sources are available in the form of radioactive isotopes.

With the great advances made in the field of atomic energy in the past dozen years, a large number of radioactive materials which emit radiation very similar to that obtainable with x-ray machines are now available. Not all these isotopes emit their radiation by the same basic physical mechanism. Variations in mechanism and type of radiation emitted must be considered in the selection of promising isotopes and in the design of radiation units. The isotopes of particular interest for use in radiography may be listed in four categories.

1. *Gamma ray-emitting isotopes.* Gamma rays, like x-rays, are electromagnetic radiations of short wave length. They are identical to x-rays in physical characteristics and effects on tissues, and differ only in their origin. Whereas x-rays arise from transposition of orbital electrons of an atom, or by *bremsstrahlung,* gamma rays are emitted from the nucleus itself. Certain isotopes emit either or both types of radiation. When an atom nucleus is made unstable (by neutron bombardment in the case of most artificial isotopes) it may return to a stable state by emission of one or more of its component particles (beta or alpha particles). In so doing it goes to a so-called "excited" state (higher energy level). It then may return to a normal energy state ("ground" state) by the emission of energy in the form of one or more gamma rays. While most of the gamma-emitting isotopes emit rays of energies too high to be useful in diagnostic radiography, there are a fair

number which have gamma rays of energies in the range of 30 to 100 kev. Such isotopes are potentially applicable to diagnostic work.

2. *K-electron capture isotopes.* Some isotopes have relatively too many positive charges in the nucleus. To correct this situation the nucleus may draw in an electron (negatively charged) from the closest orbit of satellites, namely the K orbit. This missing electron is then replaced by an electron from an outer shell. When the electron moves in, an x-ray is emitted in the same manner as from the metallic target of an x-ray machine. In the case of certain isotopes this x-ray is of proper energy for diagnostic use and has been utilized experimentally.

3. *Internal conversion isotopes.* In certain gamma-emitting isotopes of proper configuration the gamma ray may not escape through the orbital electrons but may react with one of the electrons and impart enough energy to it to cause ejection from the orbit. The place of the ejected electron is then taken by an electron from an outer orbit and an x-ray is emitted in the process. This mechanism gives rise to a certain amount of the radiation emitted from a radioactive thulium source.

4. *Beta-emitting isotopes.* Most of the weight and lack of mobility in conventional x-ray machines is associated with obtaining high energy electrons for bombarding a suitable target. There is nothing unique about these electrons and any source giving a sufficient number of similarly energetic electrons could be substituted for this part of the x-ray machine. There are a number of isotopes which emit beta particles of various energies. Because beta particles are electrons, it appears likely that such isotopes might be of value for the production of x-rays. In the simplest form an "x-ray machine" could be made with a beta source in the following manner. Encapsulate the radioactive material with a sufficient thickness of steel or other material to prevent the escape of any beta particles. This is easy to do because these particles are not very penetrating. Then add enough additional shielding material on all sides except one to prevent the escape of x-rays. An x-ray beam will then be obtained through the unshielded side. There are, in such a simple device, three mechanisms by which beta particles give rise to x-ray. These mechanisms are:

(a) "Characteristic" x-radiation. When the beta particles strike atoms of the encapsulating material or other source atoms, in a certain percentage of cases they will eject electrons from one of the electron orbits. When this ejected electron is replaced by the moving in of an electron from another orbit an x-ray is emitted. The energy of this x-ray will be a characteristic of the type of atom (the element) bombarded.

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(b) External *bremsstrahlung*. As the beta particles are slowed down and finally stopped by the encapsulating or source material itself, many of them will give up their energy as x-rays (*bremsstrahlung* or braking radiation).

(c) Internal *bremsstrahlung*. In addition to the above two mechanisms, which occur in the conventional production of x-rays, there is a third mechanism which is peculiar to isotopes. The beta particles which are emitted are electrons which are ejected from an atom nucleus. The nucleus has certain energy forces which hold it together. When these electrons (beta particles) are ejected they may be slowed slightly or their direction may be changed by the nuclear energy forces. The energy of motion which they lose may then appear as radiant energy (x-rays). These x-rays are designated as internal *bremsstrahlung* to indicate that the interaction of the particle with the emitting nucleus is responsible for the production rather than the reaction of the particle with some neighboring or remote atom as in the case of external *bremsstrahlung*.

In addition to simple considerations of energies emitted by various isotopes there are other factors of importance in the selection of isotopes for radiographic use. No isotope continues to emit radiation for an infinite period of time and the rate at which radioactive strength is lost varies from one isotope to another. The rate of loss of activity is generally denoted as the "half-life" of the isotope, *i. e.*, the length of time required for loss of half of the original source strength. It is obvious that to be of practical value for radiography an isotope must possess a reasonably long half-life.

Another factor which requires consideration is the relative availability and ease with which an isotope can be produced. For isotopes which are produced by activation of an inert form in a nuclear reactor (thulium, for example) the so-called neutron capture "cross section" is of importance. The cross section is an index of the probability that any one neutron will react with an atom of the material to produce a radioactive atom. The higher the cross section the easier it is to produce an isotopic source of high strength.

THE PORTABLE THULIUM SOURCE

Thulium^{170} is the radioisotope produced by neutron bombardment of naturally occurring thulium^{169}. It emits an 84-kev gamma ray and an associated 52-kev x-ray produced by internal conversion. Both these radiations are of proper energy to be useful for human radiography. Because of the beta particles which are also emitted in the radioactive decay of thulium there is an accompanying *bremsstrahlung* and characteristic x-radiation which results in a wide total spectrum of radiation energies. These accom-

panying radiations, however, probably do not seriously interfere with picture taking. In addition to possessing radiation of proper energy the thulium possesses other desirable characteristics. It decays with a 129-day half-life that assures a reasonably useful life. Thulium^{169}, the parent material, is reasonably easy to activate in a nuclear reactor, because it has a neutron cross section of 118 barns. Due to these desirable characteristics thulium^{170} had been used previously by other workers to demonstrate the feasibility of isotopic radiography and was chosen by this laboratory for use in the development of a practical source unit.[1]

A 400-mg. (about 1/70th of an ounce) sample of thulium obtained from the Ames Laboratory was activated in the materials testing reactor at the National Reactor Testing Station in Idaho. The active material was doubly encapsulated in a thin aluminum container to prevent any leakage of radioactive material and placed in a lead hemisphere 5 inches in diameter to prevent exposure of transporting personnel to radiation. The sphere contained appropriate ports for loading and for exit of the radiation beam. A shutter mechanism was incorporated to allow precision of exposure times. The entire unit, which weighed 48 pounds, was then mounted on a pack frame for easy mobility. The source unit and pack frame are shown in figure 1.

The source unit is extremely simple to operate and requires little training. It is set up for use on telescoping tripod legs which allow easy adjustment of distance from source to the specimen to be radiographed. The shutter mechanism is opened manually and is closed by a manually operated cable release. Exposure times (which with the present source vary from 15 to 180 seconds depending on type of film used, body part radiographed, et cetera) are measured with a stop watch or with a sweep second hand of a wrist watch. Figure 2 illustrates the operation of the source unit.

Any type of standard radiographic film or paper can be used with the source. The best results, of course, are obtained with standard film and darkroom developing. Because specialized equipment required for darkroom work may not be available under field conditions it may be necessary to use some sort of "self-contained" cassette (film pack). There are a variety of potential methods for producing cassettes which are suitable for field use. The Land-Polaroid method uses individual packets of developing and stabilizing material which are integral parts of the cassette. Methods of simple, rapid development with a minimum of supplies as well as daylight processing are also available. Figure 3 illustrates a typical roentgenogram taken with the portable source and developed by conventional means. Figure 4 shows a roentgenogram taken with the portable source and developed in an experimental type cassette developed in this laboratory. This particular type of cassette is completely "self-contained" and requires no addi-

Figure 1. Portable thulium source mounted on pack frame.

tional facilities or equipment. While these roentgenograms do not match the technical excellence of conventional types it is apparent that they are adequate for most emergency work. It is anticipated that considerably better pictures can be obtained with improvements in the source and in developing technics.

THE PORTABLE ISOTOPIC BETA-EMITTING SOURCE

In view of the numerous possibilities for the production of useful diagnostic radiations from isotopes it is apparent that the thulium gamma ray source is not necessarily the only or best method for isotopic radiography. After considering alternative methods of isotopic radiography, it was decided to attempt to adapt pure beta-emitting sources to the problem by using the basic principle by which conventional x-rays are produced. X-rays

are conventionally produced by bombarding a metallic target with high energy electrons. The energy of the x-ray beam produced is

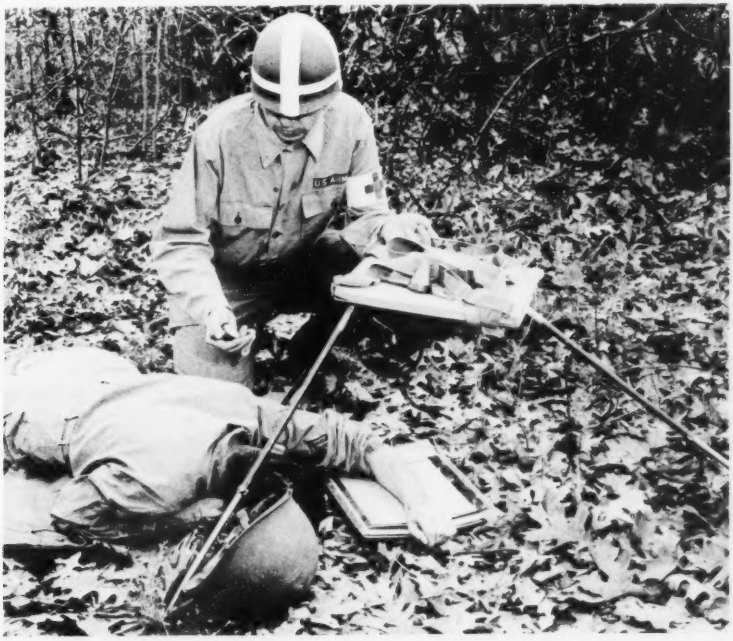

Figure 2. Operation of the portable thulium source.

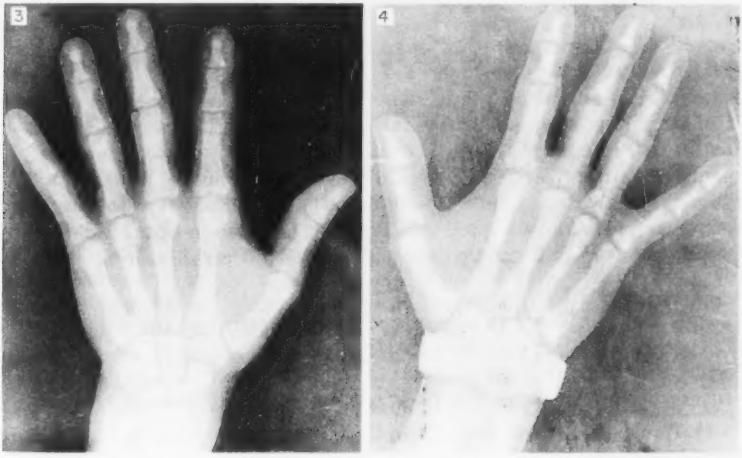

Figure 3. Typical roentgenogram taken with portable source and developed by conventional means. Figure 4. Roentgenogram taken with portable thulium source and developed in an experimental "self-contained" cassette.

characteristic partly of the target material and partly of the energy of the incident electrons. Beta particles are electrons and various isotopes emit these electrons with various energies. By obtaining an isotope with proper energy and encasing it in a suitable "target" material it should be possible to closely approximate a conventional x-ray beam. It will not be identical because of an internal *bremsstrahlung* component (one source of x-rays) which is characteristic of the isotope and because of external *bremsstrahlung* and characteristic radiation produced in the source material itself. These factors will tend to give a broader spectrum of energies than is obtained with an x-ray machine.

In order to test the application of this principle to the problem of isotopic radiography the following preliminary studies[2] were made. A commercially available beta particle source consisting of radioactive strontium and radioactive yttrium in an equilibrium mixture was obtained. The active material as obtained was completely encased in a steel cylinder. At one end of the cylinder the wall is very thin (0.002 inch of steel and 0.010 inch of aluminum). This wall is sufficiently thin to allow some of the beta particles to pass through it. Such beams of beta particles are widely used in medical practice. The emergent beam consists almost entirely of beta particles emitted from the yttrium ^{90} which gives off the more energetic particles. Practically none of the beta particles emitted by the strontium ^{90} are able to penetrate this window. A certain percentage of the beta particles stopped by this source material itself, the walls of the cylinder, or the thin window give rise to x-rays (characteristic and/or *bremsstrahlung*). These rays were used to make roentgenograms. Because the beta particle beam emergent through the thin window would contribute radiation dosage to the subject without contributing to picture taking, the entire source was placed in a lucite well which absorbed these beta particles without interfering particularly with the x-ray beam. Figure 5 illustrates the setup used to make radiographs with strontium source. Despite a number of technical disadvantages to the particular source used (for example, it had a large focal spot and relatively low source strength), remarkably good radiographs have been obtained. Figure 6 shows a typical radiograph made with this arrangement.

This type of isotopic radiography is still in the experimental stage and has not been developed to the point of practical usage as yet. It does show considerable promise, however, and, together with the thulium unit, tends to indicate the vast potential for future development in the field of isotopic radiography.*

*The unit described and built at the Army Medical Research Laboratory is an experimental model and, although it is undergoing field tests at the present time, it has not been accepted as a standard item, is not in large-scale production, and will not be made available for general use or distribution until all tests conducted at designated testing stations have been completed.

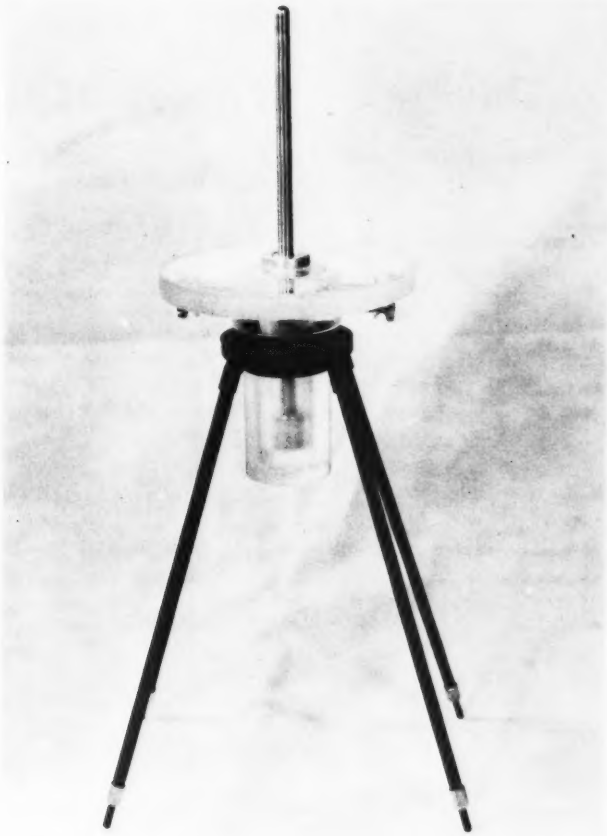

Figure 5. Experimental setup for beta radiography.

COMMENTS AND CONCLUSIONS

Diagnostic radiography of human beings by means of radioisotopes is still largely in the experimental stage although feasibility of the use of thulium^{170} has been amply demonstrated, and radiographic units employing this material will probably become available in the near future. Such portable units would undoubtedly prove of great value to the medical services for use in the field (battalion aid, collecting, or clearing stations), in remote or isolated installations, or for emergency use in the event of civilian disasters. At the present time isotopic units cannot compete with conventional x-ray machines from the point of view of diagnostic excellence. Their value is primarily in their portability. The diagnostic excellence can undoubtedly be improved by further research and development. Improvement in the design,

Figure 6. Typical radiograph made with strontium source.

source strength, and purity of the thulium source described in this report is relatively easy to accomplish and would add considerably to the contrast and definition on films made with it.

One difficulty with isotopic sources is that the energy spectrum emitted is relatively fixed and cannot be easily varied as it can with conventional Coolidge tube x-ray machines. Changes in energy are desirable for making radiographs of various body thicknesses. It seems likely that with further research a number of isotopes emitting different gamma or x-ray energies can be developed for practical use. It might then be feasible to mount a number

of these isotopes on a revolving disk inside a radiation shield. The radiographer might then be able to rotate the proper source into position for use in much the manner that a microscopist selects the lens on his microscope for proper magnification. When and if such an isotopic x-ray machine is developed the combined portability and versatility of the unit should prove invaluable to the military medical service.

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"NO RADIOLOGICAL HAZARD"

Many patients are given tracer doses of radioactive isotopes as a diagnostic procedure. In the event of an accidental death such a patient constitutes no radiological hazard because the tracer doses used are small. Radioactive gold (Au^{198}) and radioactive iodine (I^{131}) are, however, used therapeutically. This is done only in a hospital, and the hospital is required to have a radiation safety officer. No patient receiving isotopes should be discharged from the hospital until his radioactivity is down to 30 mc. If such a patient dies suddenly after leaving the hospital, there is no radiological hazard in performing an autopsy or embalming the body.

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DIAGNOSTIC CRITERIA OF FIBULAR COLLATERAL SPRAIN OF THE ANKLE

MARSHALL K. STEELE, Jr., *Lieutenant (MC) USN*

EVERY plantar-flexion inversion injury of the ankle joint, unaccompanied by roentgenographic evidence of a fracture, is classified as a sprain but should be considered a potentially self-reduced dislocation until proved otherwise.

It is true that the sprain dislocation is of momentary duration, and that it is spontaneously reduced, but if such an injury is treated as a simple sprain, serious incapacity may remain because of relaxed ligaments and easy subluxation of the ankle joint.

In the simple sprain, there has been stretching or tearing of a few fibers of the fibular collateral ligament of the ankle with normal stability of the joint. On the other hand, in a severe sprain, there has been an avulsion of part or all of the components of the external ligament, including the lateral capsule, with increased mobility of the talus whenever the foot is forcibly inverted and plantar-flexed.

Sprains have long been recognized, as is indicated by the story of Darius in 400 B. C., and yet there are but few scattered reports on the subject of injury to the fibular collateral ligament of the ankle.

Bonnin[1] and Watson-Jones[2] have investigated and reported on this injury. Bonnin stressed the importance of the calcaneofibular ligament. Leonard[3] and Anderson and associates[4,5] discussed the anterior talofibular ligament in an attempt to correct the pathologic anatomy. Watson-Jones described clinically a well-defined sulcus beneath the lateral malleolus, such as is noted in figure 1. This patient had had an unstable ankle for two years, which was surgically repaired successfully in 1953.

Likewise, Watson-Jones noted the roentgenographic evidence of tilting of the talus, as seen in figure 2. There is loss of parallelism between the articular surfaces of the talus and tibia, with a tilt of the talus in its long axis. This is an indication of rupture of one or more components of the fibular collateral ligament. The anteroposterior view of the ankle is taken with

From U. S. Naval Hospital, Philadelphia, Pa.

stress applied on both the inverted and plantar-flexed foot. Watson-Jones found this necessary in the diagnosis of the less severe sprains. If pressure was applied gently but firmly, little or no pain was produced and no anesthesia was required.

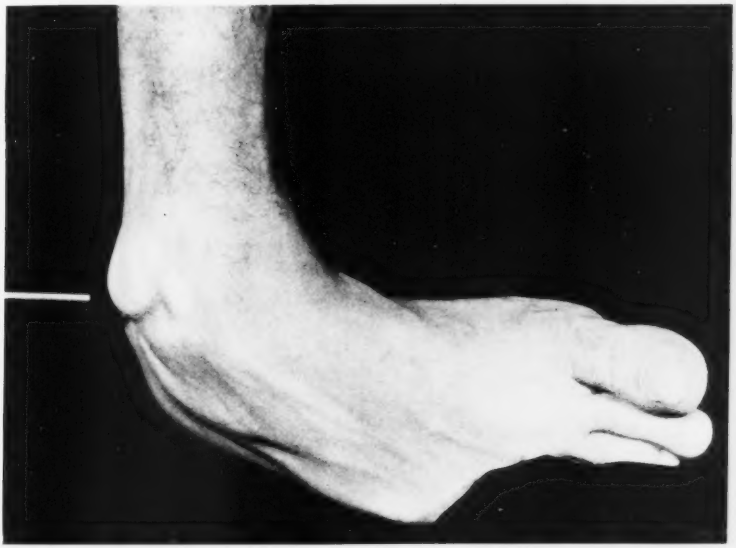

Figure 1. A well-defined sulcus beneath the lateral malleolus is evident.

Clayton and associates[6] reported adequate paralysis of the peroneal muscles by injecting into the peroneal nerve at the fibular head, thus avoiding the possibility of infection of the hematoma, as seen in figure 3. Hutcheson[7] reported on testing relaxation of the fibular collateral ligament after the local sural nerve block was performed as demonstrated in figure 4. The injection is made along the lateral border of the fibula, about 3 inches proximal to the tip of the lateral malleolus. This latter method of nerve block for the roentgenographic diagnosis of the severe sprain is the one most frequently carried out at this hospital. Others have advocated the use of general anesthesia to accomplish the same purpose.

Because of the frequency of this type of sprain in the 18- to 45-year age group, and because of the disability that it produces, especially if improperly treated, it is significant in military as well as civilian medicine.

ANATOMY

There are three components of the fibular collateral ligament: the anterior talofibular, calcaneofibular, and the posterior talo-

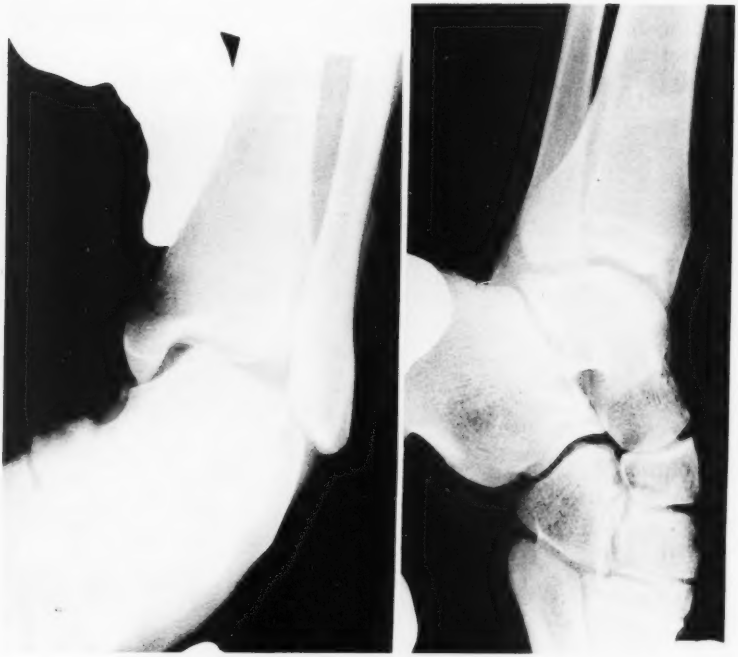

Figure 2. Tilting of the talus is demonstrated in these roentgenograms.

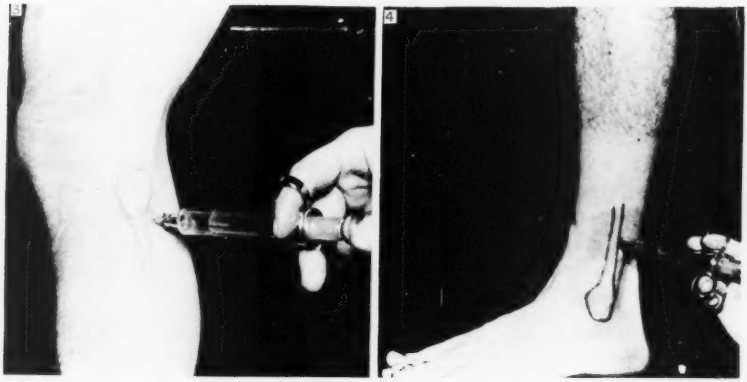

Figure 3. Paralysis of peroneal muscles is produced by injection of peroneal nerve at the head of the fibula.

Figure 4. Sural nerve block is performed by injecting procaine along the lateral border of the fibula, about 3 inches proximal to the tip of the lateral malleolus, according to Hutcheson's[7] method.

fibular fasciculi (fig. 5). The anterior talofibular ligament, the shortest of the three, is located beneath the overlying capsular tissue and extends from the anterior border of the lateral malleolus to the neck of the talus. The calcaneofibular ligament, the longest of the three, is the only one which is extracapsular and extends from the tip of the fibula downward and slightly backward to the colliculis on the lateral surface of the calcaneus.

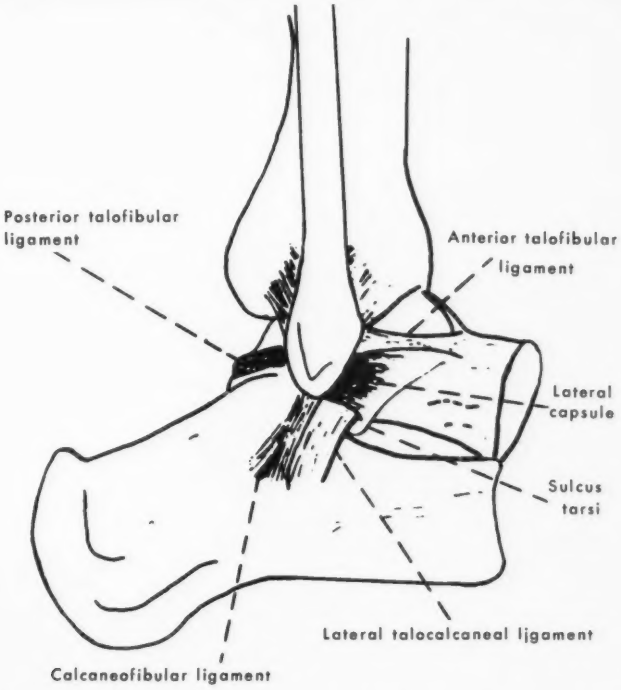

Figure 5. Diagrammatic representation of the three components of the fibular collateral ligament.

The third component is the posterior talofibular ligament, the strongest and most deeply seated of the three. It extends from the digital fossa of the fibula to the lateral tubercle on the posterior aspect of the talus immediately lateral to the groove for the tendon of the flexor hallicus longus.

The anterior and posterior articular capsule is thin, joining the tibia and the talus, whereas the lateral capsule is somewhat thickened and found between the anterior talofibular and lateral talocalcaneal ligaments, blending closely with them before passing beneath the calcaneofibular ligament. It extends from the

lateral border of the talus to the medial surface of the lateral malleolus.

DIAGNOSIS

Bonnin believes that in the severe adduction strain, which has been considered only second in frequency to external rotation violence, the calcaneofibular ligament is the first and easiest to rupture, resulting in rotation of the talus, and that further strain will, in turn, result in tearing of the lateral capsule and the anterior tibiofibular ligament due to strain on the inner fibula. On the other hand, Anderson and LeCocq[5] emphasized the importance of the tearing of the anterior talofibular ligament as the primary result of the plantar-flexion force of the inverted foot. They believed that a tear of the anterior talofibular ligament allows anterior displacement of the talus in the ankle joint mortise in the coronal plane and rotational displacement of the talus medially on its vertical axis, and when there is an associated tear of the lateral capsule, roentgenographic study will reveal the talus tilted to as much as 7 degrees. When both the anterior talofibular and calcaneofibular components are involved, the talus rotates as much as 12 to 30 degrees in its long axis. When all three components are involved, the ankle is found to be completely unstable. Anderson and LeCocq[5] had 3 such cases in the 27 they reported on. This compares with our figures of 3 unstable ankles among 24 patients with partially torn fibular collateral ligaments.

As a result of the study made by Bonnin, table 1 has been prepared to show the approximate ratio of the degree of talar tilt of the anesthetized, plantar-flexed, inverted foot to the extent of fibular collateral ligament tear.

TABLE 1. *Degree of talar tilt**

Ligaments ruptured	Talar tilt (degrees)
Anterior talofibular	5
Calcaneofibular	5-15
Anterior talofibular and calcaneofibular	15-30
Anterior talofibular, calcaneofibular, and posterior talofibular	30-45

*Adapted from Bonnin,[1] page 127.

In a study of 100 men and 100 women without histories of ankle injury, Bonnin pointed out that 4 percent of the women and 5 percent of the men had a bilateral equal congenital variant in ankle mobility, which he called the "hypermobile ankle." In these

persons he found a 5 to 15 degree tilt of the talus. Because of the danger of underestimating the severity of a sprain, all sprained ankles with this degree of tilt treated at this hospital were immobilized in plaster for 3 to 4 weeks.

From 1 January 1952 to December 1954, 73 ankle sprains without fracture were reported by the orthopedic department of this hospital (table 2). Of these, 24 (33 percent) revealed from 10 to 60 degrees of talar tilt on roentgenographic study. Admitting that this percentage is high, we have to assume that there were other mild ankle sprains treated by naval medical officers in this vicinity that never reached our department.

TABLE 2. *Reported ankle sprains (U. S. Naval Hospital, Philadelphia, Pa., January 1952 to December 1954)*

Sprain	Number	Percent
With fracture	106	
Without fracture	73	100
Mild	49	67
Severe talar tilt	24	33

Nerve block anesthesia was used in almost every one of our reported cases. In the most recent cases, we have taken lateral roentgenographic views of the forced plantar-flexed ankle, in addition to the anteroposterior forced inversion, plantar-flexed views, but have failed to demonstrate the anterior displacement of the talus described by Anderson and LeCocq.

CASE REPORTS

Figures 6 through 8 show roentgenograms of two of our patients to demonstrate different degrees of tilting of the talus. Figure 6 shows a roentgenogram, taken without anesthesia, of a severely sprained ankle in which all three components of the fibular collateral ligament are torn. Rotation of the talus is 45 degrees.

Case 1. This patient was a 41-year-old man who fell down a steep ladder aboard ship in 1950, twisting his right ankle in inversion. Because his roentgenograms were negative for fracture, he was treated for 3 days with bed rest and an ace bandage before being returned to duty. He then had increasing disability due to instability of the ankle. He was admitted to this hospital late in 1951, and underwent a Watson-Jones tenodesis of the ankle.

Case 2. The second case is that of a 19-year-old patient whose ankle was sprained in October 1954 when he was kicked on the lateral heel while playing basketball. There was a moderate degree of swelling with pain and limitation of ankle motion. The

roentgenograms were negative for fracture (fig. 7). These views were taken without anesthesia, but with the ankle forced in plantar-flexion and inversion. The talus is tilted 10 degrees.

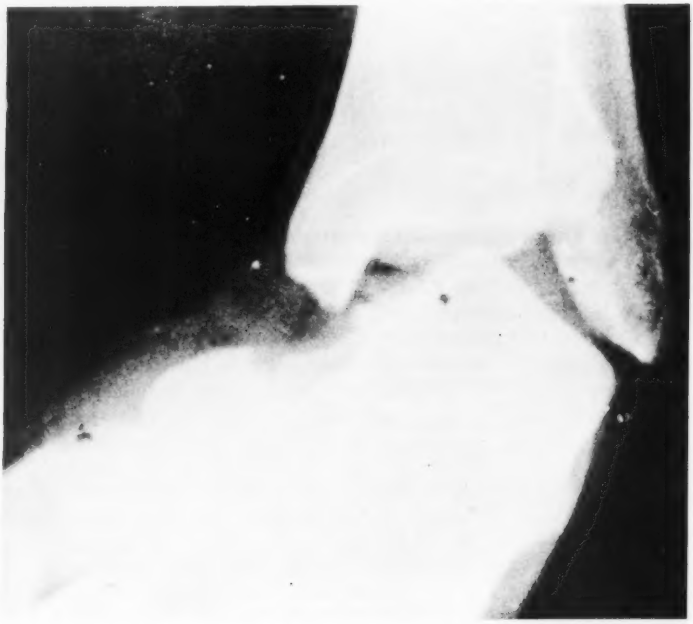

Figure 6. Roentgenogram of severely sprained ankle. Rotation of the talus is 45 degrees.

Figure 8 shows the ankle of the same patient under the same circumstances after a sural nerve block was performed. Rotation of the talus has now increased to 40 degrees, showing the effect pain and peroneal muscle spasm has in these sprains. In the lateral views, we attempted to displace the talus forward in the coronal plane, but with questionable success. This diagnostic sign of Anderson's[5] has not been seen in the few cases we have evaluated in that respect. The patient was treated with a short leg walking cast.

TREATMENT

Our treatment of lateral ankle sprains has depended on the severity of the sprain and the amount of swelling present. In the mild sprains, seen early before swelling has occurred, attention was directed toward elevation, ice bags for a few hours, bed rest, and a firm pressure dressing to prevent further swelling and produce temporary immobilization. If swelling already exist-

Figure 7. The talus of this sprained ankle is tilted 10 degrees. The ankle view is forced in plantar-flexion and inversion.

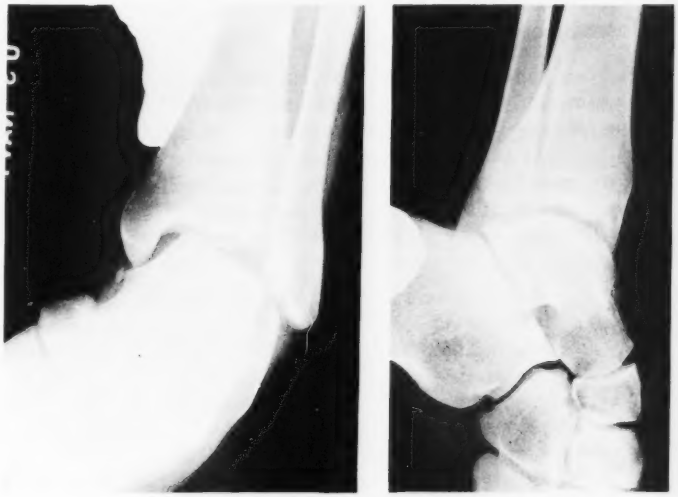

Figure 8. Same patient as in figure 7 after sural nerve block. Rotation of the talus has increased to 40 degrees.

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ed, then elevation and support alone was carried out. Active motion was permitted by the second day, ambulation by the third to sixth day, and duty by the tenth day. There were some patients who required adhesive strapping, with the foot everted, or an outer heel wedge.

In the severely sprained ankles, in which the talus was found to tilt, the early treatment was much the same as in the mild cases, except that immobilization was continued. Of the 24 severely sprained ankles reported on, 6 were originally treated elsewhere as mild, but disability continued. In 21 of these patients we immobilized the ankle with a short leg plaster cast with walker for from 3 to 6 weeks. Because of the frequency in change of duty stations, the follow-up studies have not been satisfactory; however, no recurrences were revealed.

Of the three patients with chronic subluxed ankle sprains, one was transferred without treatment to an Air Force Hospital because of a disposition problem. The one, whose roentgenograms have been shown (fig. 6) received surgical treatment 2 years following his injury. The third patient, whose talus tilted 40 degrees (fig. 8), also received a Watson-Jones tenodesis 1 year ago. Figure 9 is a recent roentgenogram of this patient's ankle, using sural nerve block anesthesia and forced inversion, plantarflexion of the foot. The talus now shows hardly a trace of tilting, and the patient is performing his full duty despite occasional soreness over the lateral malleolus after long walking and standing. Roentgenograms now show no evidence of a talus tilt.

It has been reported that acute cases of complete tears of the fibular collateral ligament oftentimes will not heal with conservative plaster treatment. In these cases, Anderson and LeCocq[5] believe that surgical intervention is justifiable as the primary treatment if the patient is placed in the hands of surgeons trained in this technic. Plaster immobilization followed by peroneal exercises and a lateral heel wedge has seemed adequate in our experience.

SUMMARY

The use of roentgenograms of both the inverted and plantarflexed foot to determine the severity and nature of the sprained ankle has been emphasized. It has been shown that the degree of sprain is more accurately demonstrated if pain and peroneal muscle spasm is reduced or eliminated. To accomplish this, several methods were mentioned; however, the orthopedic department at this hospital has found either the peroneal or sural nerve block to be adequate. Forward displacement or rotation of the talus or both is diagnostic of a severe sprain. In order to avoid the loss of man-hours at work, disability, and even medical dis-

Figure 9. Same patient as in figures 7 and 8 showing essentially no tilting of the talus.

charge from the service through improper treatment, it has been suggested that the aforesaid knowledge of the sprained ankle be more widely disseminated to those of the medical profession less familiar with its seriousness. When this is accomplished, early diagnosis and proper treatment by the physician will greatly reduce the disability resulting from such a common injury.

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A NEUROLOGIC SYNDROME OCCURRING DURING TREATMENT OF AIR EMBOLISM

JACK L. KINSEY, *Commander (MC) USNR*

THE problem of air embolism in a submarine escape training tank was presented in a previous article.[1] This report will be confined to the presentation of two cases that demonstrated neurologic symptoms, with observations during treatment.

CASE REPORTS

Case 1. This man was undergoing training in free ascent at the submarine escape training tank at this submarine base. He surfaced from a 100-foot free ascent with no apparent difficulty except for being "short of air" and needing a little lift to overcome neutral buoyancy caused by blowing out too much air during the ascent. He had been stopped at 50 feet by one of the instructors when he was noted to be "passing his bubbles" (*i. e.*, ascending faster than the bubbles of his exhaled air), and was signaled to exhale more rapidly, which he did. On surfacing, he swam to a ladder, climed out, and walked a distance of about 50 feet. Following this, he complained of weakness in his legs and of "feeling funny." His knees buckled; he laughed inappropriately, rapidly became confused, and collapsed. He was carried to the elevator and into the recompression chamber where he was under increased pressure within 3 minutes of the onset of symptoms.

At a pressure equivalent to 165 feet of water he was completely relieved, being able to stand, walk, and perform all movements of the lower extremities. In addition, he was well oriented and emotionally contained. After 30 minutes he was started up, using table 3 of the U. S. Navy Treatment Tables for Compressed Air Illness.[2] His condition remained satisfactory until about the seventh hour at the 30-foot stop (about 10 hours from onset of symptoms). At this time gradual weakness of the lower extremities and urinary retention developed. In view of the severe recurrence of symptoms, he was again recompressed to depth equivalent in pressure to 165 feet of water.

After 2 hours at this depth with no relief, it was believed that edema of the spinal cord resulting from the original trauma was the basis for his symptoms, and he was started up using table 4 of the treatment tables. During the 38-hour decompression on this table the patient made

From U. S. Naval Medical Research Laboratory, U. S. Naval Submarine Base, New London, Conn. Comdr. Kinsey is now assigned to Staff, Commander Submarine Squadron Five, FPO, San Francisco, Calif.

gradual but incomplete recovery. Voluntary movements returned to the lower extremities, and increased muscle strength was noted. The patient was able to stand with a little help and walked out of the chamber with assistance. He was admitted to the base infirmary and observed and treated there for 3 weeks. Treatment consisted of administration of antibiotics, regular catheterization to prevent bladder complications, physiotherapy, and general supportive measures. When he was discharged to duty, residual neurologic signs were minimal.

Comment. In considering the cause of this clinical picture it must be noted that the man was not only overexposed by 5 minutes to a depth of 112 feet (according to the U. S. Navy Standard Decompression Tables[3]), but he also was traveling ahead of his bubbles for a short period at about 50 feet. The differential diagnosis between decompression sickness and air embolism could not be definitely established; in fact, it could have been either or both, with central nervous system involvement in the spinal cord and brain.

Case 2. This man was being trained in free ascent. On a previous day he had successfully completed two 18-foot and one 50-foot free ascents. His 50-foot ascent was not technically perfect as he apparently expelled too much air and, being of almost neutral buoyancy, had to have some help reaching the surface. On the day of his accident he was scheduled to make one 50- and one 100-foot free ascent. He left the 50-foot lock and started his ascent in a proper manner. At about the 35-foot level, however, his rate of ascent accelerated. He was signaled to exhale more rapidly, and the instructor attempted to hold him. He slipped from the instructor's grasp and ascended rapidly until another instructor dropped from the surface, stopped him at the 15-foot level, held him until he had expelled all the air possible, and then helped him to the surface. On reaching the surface, he answered affirmatively when asked if he felt all right and immediately collapsed into what appeared to be a tonic convulsion.

The man was carried to the recompression chamber, and pressure was begun less than 2 minutes from the onset of symptoms. Due to a misunderstanding he was recompressed to a depth equivalent to 180 feet of water. This took 2½ minutes. He regained consciousness almost immediately. During the period of recompression the right arm and both legs were rigid, and the left arm was flaccid. After 1 minute at the 180-foot level the tonic contraction of the muscles of the right arm and both legs subsided. At this time the left leg was definitely weaker than the right, and the left arm remained flaccid.

He was kept at this level for one-half hour, then brought to the 165-foot level where it was decided to decompress him, using table 4 of the treatment tables. The muscle strength of the left arm and leg returned gradually, and about an hour later voluntary control of the left arm and leg returned, including fine movements of the hand and fin-

gers. An area of hypesthesia involving the entire left arm and shoulder was noted at this time. The tendon reflexes were bilaterally equal and within physiologic limits, and no pathologic reflexes were elicited.

About 4½ hours after treatment began, and at the 60-foot level, the patient noted some difficulty in locating food on his plate. Neurologic examination disclosed the left extremities to be somewhat weaker than the right, and the tendon reflexes less reactive than the right. Three hours later the weakness had increased markedly. He was unable to stand because of weakness in the left leg, and while sitting would drift to the left. Subjectively, there was the complaint of numbness in the left arm and shoulder which corresponded to the area of hypesthesia noted earlier.

In the light of the previous experience with neurologic air embolism, and because the recurrence of symptoms was not severe, the decision was made to continue with decompression according to the treatment table (table 4). At the next stop (50-foot level) the left-side weakness gradually receded, and 3 hours later the patient was able to stand unaided. Improvement continued and on reaching the surface he had apparently completely recovered neurologically. He was observed at the station hospital for 2 days and discharged to duty.

Comment. From the standpoint of the mechanics involved in air embolism it was interesting to learn, from later discussions with the patient, that he was aware of his increased rate of ascent and the need to exhale more rapidly. He stated that he was conscious of his previous failure to complete his 50-foot ascent because of exhaling too much, and to counteract this inspired as deeply as possible; however, in spite of the knowledge that he was "passing his bubbles" and a feeling of increasing tension in his chest, he could not increase his rate of exhalation. In other words, he was ascending so rapidly that the rate of expansion of the air in his lungs was increasing to the point that a relative expiratory bottleneck apparently developed and his maximum rate of exhalation was insufficient to reduce the intrapulmonic pressure. The basis for the "bottleneck" may be a change in configuration of the tracheobronchial tree similar to that which was reported by Ross[4] as occurring during coughing.

DISCUSSION

Two patients have been presented, one with decompression sickness and/or air embolism and one with air embolism, both of whom exhibited findings indicative of serious central nervous system damage.

The initial neurologic conditions were relieved in both instances by recompressing the patients to a pressure equivalent to a depth of from 165 to 180 feet of water, after which they were slowly decompressed according to the U. S. Navy Treatment

Tables 3 and 4. After from 5 to 10 hours of decompression treatment the original symptoms reappeared markedly in case 1, and quite mildly in case 2. The first patient was recompressed to 165 feet a second time, with no improvement after 2 hours at this depth, and was again decompressed slowly (table 4) with gradual improvement. The second patient not only was not recompressed a second time but, in view of the relatively mild recurrence of symptoms and our previous disappointing experience with recompression in the first patient, was taken to his next decompression stop (50 feet) with no apparent deleterious effects.

It is postulated that in both of these patients the recurrence of neurologic signs was determined by localized edema in response to the original trauma. Hemorrhage was considered unlikely in view of the relatively transient nature of the recurrences. In case 1, the severity of the signs were at least partially accounted for on the basis of the spinal cord involvement and the small volume available for expansion in this area before marked impairment of function ensued; in case 2, the relatively mild recurrence could be attributed partially to a greater volume available for expansion before pressure impaired function, and possibly to a less severe involvement originally.

The lack of response to the second recompression in the first patient and the improvement without further recompression in the second suggests that recurrence of bubble formation was not the symptom-producing factor involved.

It must be pointed out that in casualties of this nature there is no diagnostic procedure which can differentiate the symptoms due to recurrence of bubble formation from those of localized edema except the response or lack of response to changes in ambient pressure. In doubtful cases, or in those with severe recurrences, it may be best to recompress in accordance with treatment tables. In those with mild recurrences or possible complicating brain or cord injury, however, it may be advisable to proceed with decompression for at least one or two stops, with the patient under careful observation. If there is no further deterioration in condition, or if improvement begins again (as in case 2), it can be assumed that the recurrence of symptoms is not due to bubble formation, and the decompression can proceed in routine fashion.

SUMMARY

During treatment of neurologic types of decompression sickness and air embolism in two patients, the initial neurologic symptoms recurred to a greater or lesser extent from 5 to 10 hours after the original trauma. These symptoms were not affected by changes in the ambient pressure.

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THE EXECUTIVE

As everybody knows, an executive has practically nothing to do except to:

1. Decide what is to be done;

2. Tell somebody to do it;

3. Listen to reasons why it should not be done, why it should be done by someone else, or why it should be done in a different way;

4. Follow up to see whether it has been done;

5. Discover that it has not been done;

6. Inquire as to why;

7. Listen to excuses from the person who should have done it;

8. Follow up again to see whether the thing has been done, only to discover that it has been done incorrectly;

9. Point out how it should have been done;

10. Conclude that as long as it has been done, it may well be left where it is;

11. Wonder whether it is not time to get rid of a person who cannot do a thing right; to reflect that he probably has a wife and a large family and that certainly his successor would be just as bad and maybe worse;

12. Consider how much simpler and better the thing would have been done if one had done it oneself in the first place;

13. Sadly reflect that one could have done it right in 20 minutes and, as things turned out, one has to spend two days to find out why it has taken three weeks for somebody else to do it wrong.

—OSSINING ROTARY CLUB
New York Journal of Medicine
Jan. 15, 1954

PSYCHOPATHOLOGIC REACTION PATTERNS IN THE ANTILLES COMMAND

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A GROUP of striking psychopathologic reaction patterns, precipitated by minor stress in persons with well-defined character disorders, has been observed in a limited section of the insular (Puerto Rican) personnel of the Antilles Command. Because of their clinical resemblance to more serious conditions such as schizophrenia and epilepsy, these behavior disorders present a problem in medical management and administrative disposition.

In order to analyze the components of these reactions, all of the outpatients and the medically evacuated inpatients seen at this hospital from 1 January to 31 December 1954 were studied. A total of 998 outpatients was observed, of which 517 were insular military personnel. Sixty-one inpatients were evacuated through medical channels.[1]

PATTERNS OF REACTION

The most outstanding reaction pattern is characterized by a transient state of partial loss of consciousness, most frequently accompanied by convulsive movements, hyperventilation, moaning and groaning, profuse salivation, and aggressiveness to self or to others in the form of biting, scratching, or striking; and of sudden onset and termination. Less often there is complete flaccidity. The duration varies from an isolated crisis of a few minutes to a series, lasting a few hours in the convulsive form and up to two days in the flaccid variety. The reaction produced by the episode in the immediate environment appears to directly influence its duration; the greater the secondary gains, the longer it lasts. The crises are quite spectacular, and when they take place in the company area or at home they cause great alarm and confusion to those around the patient and, in some instances, immediate removal of the source of stress. They also bring considerable attention and special privileges to the patient, and when he is brought to the hospital and placed in seclusion in a cool, semidarkened room, his symptoms usually subside in a few minutes.

From Rodriguez Army Hospital, APO 851, New York, N. Y.

The degree of dissociation from the environment is never complete, and the patient evidences some awareness of his surroundings, especially when he believes that he is not being observed. He is also careful to avoid sustaining serious injury, and at the onset of the crisis finds a bed or falls gradually to the ground. Upon termination of the crisis he claims complete amnesia for it, often appears more alert than prior to it, and expresses a sense of relief, as though he had experienced an emotional catharsis.

Another pattern consists of sudden outbursts of verbal and physical hostility, with destructiveness, assaultiveness, and expression of some persecutory trends. During these episodes the patient is markedly hyperactive and noisy but is discriminatory in the type of property he destroys and the persons he attacks. Some of these patients also claim complete amnesia for the outburst, particularly those who face disciplinary action as a result of it. These episodes are of very short duration, but repeat themselves often if the precipitating stress is not removed. They are locally known as "mal de pelea" (disease of fighting). The patient's personality in the interval between attacks shows only the traits of the character disorder to be described later.

A third pattern is manifested by transient regression to infantile emotionality and behavior, has a rapid onset, and lasts up to a few days. The patient sobs and cries freely, assumes an attitude of complete helplessness, and tends to depend on others in a childlike manner. His speech is characteristically infantile and the over-all picture gives the impression of mental deficiency. On occasions he is found adopting fetal positions. Ordinarily the clinical picture disappears overnight, and the patient awakens entirely free from symptoms and with a good recollection of his past behavior. There is usually a feeling of relief and well-being similar to the one observed after the pattern described earlier.

Pseudosuicidal attempts constitute the fourth clinical modality found in some of these men. Superficial scratches on the anterior aspects of the wrist, forearm, and chest, carefully inflicted with razor blades, fountain pens, or pins are the commonest means of self-injury. The ingestion of rat poison or disinfectants mixed in drinks and attempts at hanging are also frequent. All of these attempts are made in a dramatic fashion, in the presence of various people who can easily intercept the act. Many of them occur at home while on pass, and the patient makes a histrionic announcement of his intentions to his family.

A last pattern of reaction, considerably less striking than the previous four, is characterized by mild dissociation manifested by inability to concentrate, forgetfulness, loss of interest in personal appearance, some degree of preoccupation, and slight flattening of affect. It usually lasts one or two days.

These clinical reactions do not exclude one another; on the contrary, two or more varieties may be found to occur in the same person at different times.

PRECIPITATING FACTORS

Some types of minor stress that precipitate the above patterns of reaction include induction into the Armed Forces; transfer from induction center to basic training camp; experiences in basic training, particularly the weapon familiarization, infiltration, and combat courses; prolonged hikes; stand-by details that prevent going home on pass; minor reprimands from officers and non-commissioned officers; and alerts for overseas shipment and routine overseas duty. It is of interest to note that the prospect of discharge from the service at the completion of a tour of duty and the consequent return to a smaller income and lower living standards are also important precipitating factors.

A careful survey of the psychiatric histories of these patients reveals remarkable similarities in the genetics and dynamics of their personalities. The first and most outstanding feature is a strong maternal attachment and dependence, which is not produced or encouraged essentially by overprotective or overpossessive maternal attitudes as is the case in more sophisticated groups, but which is passive on the part of the mother and passive-aggressive on the part of the child. The patient often verbalizes this attachment by expressions to the effect that he will never marry as long as his mother is living because "Mother always comes first," et cetera. At times it acquires such extreme proportions that the son sleeps in the same bed with the mother up to the time of induction. This attachment continues even if the patient marries and becomes responsible for severe interpersonal problems and conflicts of loyalties. It is not unusual to find that the patient brings his wife to live in the parental home, or that on weekend passes he goes to visit his mother first.

A second element in common consists of a lack of proper identification with the father or with an adequate masculine figure. This is based on the father's equally dependent, inadequate personality. The usual findings indicate that he stopped working during the patient's early childhood or even earlier, because of a minor injury or ailment; or that he has abandoned the family; or that he drinks to excess and works sporadically.

The environmental conditions under which some of these persons have been brought up—with little influence from our highly competitive culture, satisfied with simple seasonal work such as harvesting sugar cane or semitropical fruit, living on a very small income—form the third common feature in the backgrounds of these patients. In the early part of this study it appeared that those persons brought up in rural communities formed the great

majority of those affected. As the observations proceeded, however, it became evident that a fairly large group of patients lived in a large community such as San Juan, yet were amazingly confined to a very small section of it, almost entirely removed from the cultural progress of the city. Exceptionally these reaction patterns have been observed in persons of the social middle class whose strong maternal attachment and weak masculine identifications were prominent.

Typical histories revealed that these patients showed the predominant reaction pattern or a mixture of patterns from their adolescent years or earlier, while under such minor stresses as being reprimanded by a parent or schoolteacher, arguing with a girl friend, or watching a street fight or other display of hostility. Those who had a pattern of verbal and physical hostility usually had a record of difficulties with the police. Because these reaction patterns had occurred from childhood or adolescence—under minor stress, always episodically, followed by complete spontaneous remission of the symptoms, and with only the hysterical personality traits present during the intervals—they were clearly outlined as character disorders. In contrast with those suffering from acute dissociative reactions, these patients showed no neurotic symptoms except for these transient reactions.

The character disorder resulting from these factors was that of a hysterical personality marked by: (1) Emotional instability; (2) extreme but essentially passive dependency needs that acquired a hostile, aggressive character when there was a threat of loss of their source of dependence (these needs, however, were easily transferred from the mother to an institution like the Army, the hospital, et cetera); (3) marked sensitivity with great inability to tolerate pain, criticism, punishment, or any other form of rejection; (4) suggestibility; and (5) psychosexual immaturity.

PROBLEMS IN MANAGEMENT

The person with this type of personality is particularly predisposed to cling to secondary gains such as those obtained from hospitalization. He does not want to return to duty, and insists that he "should be cured" or given a pension because he "will never be the same again." In view of this tendency, a complete social history was taken on arrival at the hospital and before the patient was actually admitted; in this manner it was possible to obtain a detailed account of any psychopathologic condition existing prior to enlistment, because 1 or 2 days later the patient would give a totally different version, emphatically denying any symptoms before induction.

The admission of such patients was strongly discouraged and the advantages of handling them on an outpatient basis were

explained to the medical and administrative personnel of the hospital and various dispensaries. Lectures on the nature and management of the more spectacular reaction patterns were delivered to all officers and to the first sergeants of the basic training center of this Command. The result was a considerable decrease in the inpatient load in the course of the 1-year period used for statistical studies. The average number of admissions per day in January 1954 was 45.3; in the following December, excluding the holiday period, it was only 13.6. When admitted to the hospital these patients were only kept for the necessary period of observation and promptly returned to duty while awaiting disposition, before the attachment to the more protective atmosphere of the hospital could take a firm hold.

Many of these patients were referred to the hospital on an emergency basis as psychotics and in view of the bizarre, acute manifestations were considered to be very dangerous to themselves or others. With the assistance of the above-mentioned lectures, however, the understanding, especially of the line officers and enlisted personnel, improved greatly during the past 17 months.

Of the 517 insular military personnel, 281 were diagnosed as having character disorders; 202, or 71.9 percent of these, presented hysterical personality reactions as seen in table 1. Electroencephalographic studies were made in 29 of the 31 patients with partial loss of consciousness (group 1); normal tracings were found both awake and asleep. Sixty patients did not have a complete grammar school education; 47 had finished the eighth grade.

TABLE 1. *Reaction patterns in 202 patients with hysterical personality*

Group	Reaction	Number	Percent
1	Partial loss of consciousness	31	15.3
2	Crises of hostility	50	24.8
3	Transient regression	23	11.4
4	Pseudosuicidal attempts	19	9.4
5	Mild dissociation	79	39.1
	Total	202	100.0

Although the majority of the patients under consideration (124 out of 202) showed the typical reaction patterns during the course of basic training or before, others developed symptoms in the period of pre-embarkation leave or while assigned to duty in Puerto Rico.

Some of these patients went overseas and usually a few weeks or a few months later were evacuated through medical channels. Due to the language barrier, the repeated episodes of bizarre behavior, and the cultural differences, they were given various diagnoses. Sixty-one patients were admitted on that basis during the calendar year of 1954; of these, 52 were diagnosed as psychotics, 4 as epileptics, and 5 as having character disorders. Of the 52 transferred with the diagnosis of psychosis (essentially with schizophrenic reactions) only 14 were confirmed as such after adequate periods of observation. The remaining 38, as observed by a review of their records, followed a similar course, and began to show some improvement when informed of the evacuation plans. By the time they reached the last hospital before their final flight to Puerto Rico their behavior usually permitted them to be kept in open wards; upon arrival at this hospital they were asymptomatic. Of the four patients with diagnoses of epilepsy, one was confirmed clinically and by electroencephalogram; the other three had histories of "attacks" of the first pattern described and negative electroencephalograms. The five diagnoses of character disorder were fully confirmed.

In view of the fact that these patients presented no symptoms after their arrival here and had developed secondary gains from previous hospitalizations, we were unable to classify them accurately according to types of reaction.

It is believed that these patients with baffling symptoms and severe language barriers should be evacuated to Puerto Rico for final disposition.

SUMMARY

Five reaction patterns of the hysterical personality type were observed in insular personnel in Puerto Rico. Subjects included outpatients and medically evacuated inpatients seen at this hospital during 1954.

These episodic crises are spectacular and often simulate more serious psychiatric entities, particularly when the persons concerned are examined from the viewpoint of a different culture and language. When the sources of stress are removed, however, a basic overly dependent, emotionally unstable personality becomes evident. Neurotic symptoms are completely absent in the intervals between episodes. Attempts to rehabilitate patients with these character disorders are impeded by their extreme dependency needs and the secondary gains they derive from their illness. Administrative separation from the service is usually indicated.

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HEALTH NURSING SERVICE AT AN ARMY HOSPITAL

KERMIT H. GATES, *Colonel, MC, USA (Ret.)*
LEONA WEINER, *First Lieutenant, ANC, USAR*

A HEALTH Nursing Service was added to the Preventive Medicine Division of Walter Reed Army Medical Center early in 1954. Previously, many of the programs now actively stimulated and assisted by the health nurse were active in varying degrees only. It is believed that better care, even in such programs as venereal disease and maternal and child health, has resulted from the establishment of this service. The program established may be useful to others as a pattern or example.

The status and organization of the Preventive Medicine Division is shown in figure 1.

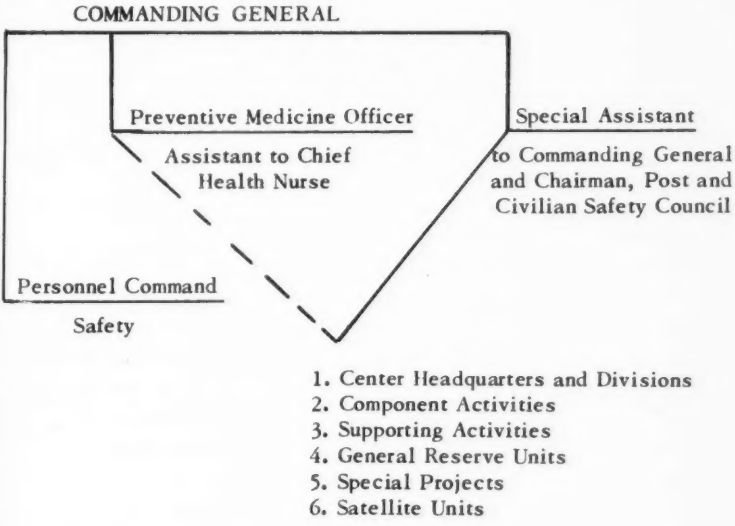

Figure 1.

From Walter Reed Army Medical Center, Washington, D. C. Dr. Gates is now Executive Director of Jackson Memorial Hospital, Miami, Fla.

The commanding general has designated the chief of preventive medicine as special assistant on a Center level. This status, plus chairmanship of various Center committees, such as the Safety Committee, provides the preventive medicine officer with information and authority of action directly responsible to the commanding general.

The following outline further indicates the individual personnel participating in the Center's preventive medicine program:

ORGANIZATION AND PERSONNEL

1. Chief of Preventive Medicine (Assistant to Commanding General / Deputy Hospital Commander)
   a. Assistant to Chief
   b. Health Nurse

The chief of preventive medicine has an assistant chief (a Medical Service Corps officer). A health nurse, two sanitary technicians, and a secretary are authorized.

The remaining partial list of officers and services demonstrates the flexibility of the organization pattern and the spread of responsibility for the specialized programs:

1. Epidemiologist (Chief of Laboratory—Hospital)
2. Venereal Diseases (Chief of Dermatology—Hospital)
3. Communicable Diseases (Assistant Chief of Medicine—Hospital)
4. Home Care (Chief of Outpatient Service)
5. Consultant (Chief of Preventive Medicine Division, Army Medical Service Graduate School)
6. Maternal Health (Chief of Obstetrics and Gynecology—Hospital)
7. Children's Programs (Chief of Pediatrics—Hospital)
8. Nursing (Chief Nurse—Hospital)
9. Safety (Center Safety Officer)

PERSONNEL USED ON THE HEALTH NURSING SERVICE

The following outline shows personnel directly assigned for health nursing activities and additional personnel utilized on a student, voluntary or co-operative, mutual-interest basis:

Assigned personnel

One Public-Health trained Army nurse
One enlisted sanitary technician

Student personnel

Dietetic interns
Advanced obstetric nursing students
Clinical technicians

Guest speakers

Volunteers
Red Cross Volunteers
Visiting Nurse Association

Liaison
District of Columbia)
Maryland) health agencies
Virginia)

The development of the Health Nursing Service Program at this Center began by establishing a "goal" and by the use of certain procedures. The goal was to promote the outpatient service as the health center, whereby preventive health activities, both on the post and in the community, could be co-ordinated to serve the best interests of the command.

The procedures used were (1) co-ordination, use, and education of the professional staff; (2) evaluation and strengthening of existing programs; (3) establishing new programs as the need and facilities arose; and (4) maintaining liaison with local community agencies.

The need for "support of command" should be emphasized. This is essential in order to obtain personnel, facilities, transportation, and support of program operation. Command support permitted an organization that would interrelate activities of the Center, such as outpatient clinic, professional services of the hospital health nurse, and off-post health facilities.

By showing the possible benefits to be derived from the Visiting Nurse Association, the professional staff were educated to use this organization.

A further procedure was to evaluate and strengthen such existing programs as the venereal disease program and the maternal and child welfare program.

The health nursing service programs initially centered on additional service in maternal and child health; primarily one of health education centered within the outpatient clinic and obstetric wards of the hospital.

The program consists of:

1. *Group interviews of new obstetric and gynecologic patients.* Until September 1954 new obstetric and gynecologic patients were interviewed in groups by the health nurse during their first visit to the clinic. The primary purpose of these interviews was to answer the patient's questions and give brief instructions on the hygiene of pregnancy.

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2. *Individual new obstetric and gynecologic interviews.* This method, adopted in September 1954, has proved to be more satisfactory than the group interview. The purpose of these interviews is to establish rapport, answer questions, introduce the patient to Army health nurse service facilities, make referrals, and to invite both husband and wife to attend the parents' classes.

3. *Orientation conference with new obstetric and gynecologic patients.* The so-called new obstetric and gynecologic orientation conference has largely substituted for the original group interview. On the second visit to the clinic, interviews are conducted with small groups of patients. The health nurse describes and explains the physical examination to be given by the obstetrician, and patients' questions are answered or presented to the obstetrician.

4. *Classes for expectant parents.* The classes for expectant parents consist of a series of five 2-hour evening sessions held once a week. The series is repeated every 5 weeks. Before and after each class, and under the supervision of the health nurse, the students practice the baby bath procedure. During each class period an appropriate film is shown. Guest speakers (dietician, psychologist, dentist) are scheduled for two sessions. The lecture-discussion method is used in teaching. Anatomic charts, models, posters, pertinent health literature, and layette equipment are used as aids.

5. *Visits to postpartum patients on obstetric ward.* Twice each week the health nurse conducts a class with postpartum patients on the obstetric ward, in which the baby bath procedure and formula making are introduced. Patients' questions are answered or referred to the ward physician. Patients, especially primiparae, are encouraged to use the visiting nurse service.

6. *Visits to postpartum clinic.* The health nurse is present in the postpartum clinic to encourage patients to contact her about their health problems. Discussions are mostly about child care, and office visits to discuss individual problems are encouraged. The health nurse's office is located in the outpatient clinic to promote availability.

7. *Premature-infant home evaluation.* Premature infants are given special attention when referred by the pediatrician. Home investigation visits are made by the visiting nurse prior to the discharge of all premature infants and a follow-up visit is made after the baby's discharge from the hospital.

8. *Child health.* The usual well-baby clinic and immunization program are conducted. The health nurse's part in this program is to invite and encourage mothers to bring their babies to the appropriate clinic conducted by the pediatric service.

9. *Follow-up file.* A "follow-up" file has been developed on babies whose mothers had a positive test for syphilis on cord blood in order to make sure the baby has repeated blood testing and physical examination.

10. *Health education films.* Movie films of an educational nature are shown in the outpatient clinic twice a week during the lunch hour. After the films are shown, a guest speaker discusses the subject of the film with the audience, which is composed of military and civilian professional staff members and lay employees. Notices of the film showings are placed in the Daily Bulletin of the Center. Films are similarly shown in parent classes.

11. *Student training.* The dietetic interns attend one parents' class as part of their training. The advanced obstetric nursing students receive 10 hours' instruction in the public health aspects of maternity nursing, as well as supervised experience with the health nurse. The advanced medical technicians assigned to the obstetric service attend one postpartum class.

12. *Health literature.* Selected pamphlets, drawn from the stock of 69 different free pamphlets supplied on request from 11 different Federal, community, and voluntary agencies are available in appropriate locations in the outpatient service and are distributed during parents' classes and lunch-hour programs.

13. *Community agency referrals.* Civilian health program referrals are on an experimental plan for 6 months with the District of Columbia Visiting Nurse Association for the purpose of promoting better health and reducing absenteeism among civilian employees. The service is limited to food service and auxiliary nursing service personnel (440 persons). Referrals are made on a sick-pattern basis and on the request on the employee. The cost of the initial visit is borne by the Visiting Nurse Association. Additional visits are charged in accordance with the Association's policies. The trend has been for employees to return to work in less time than their sick-patterns had previously indicated.

14. *Social service referrals.* Most of the referrals to the medical social work service for casework result from interviews with new obstetric and gynecologic clinic patients.

15. *Visiting Nurse Service referrals.* At present, referrals are mainly of postpartum, newborn, and pediatric patients. It is planned to extend the service to all patients in the home care plan, particularly to those in the geriatric group. Included in the liaison visiting nurse service are the groups from surrounding counties. All referrals are made by the attending or ward surgeon through the Army health nurse. The Cancer Society also pays the Visiting Nurse Service for certain visits.

16. *Red Cross parent classes.* The District of Columbia Visiting Nurse Association and the Red Cross hold parent classes. Expectant parents who are unable to attend parent classes at this Center are referred to these classes.

17. *Tuberculosis and venereal disease survey.* An annual screening of military and civilian personnel for tuberculosis and syphilis has been initiated in conjunction with the District of Columbia Tuberculosis Association and District of Columbia Health Department. There were 68 persons with positive serologic reactions for syphilis in the June 1954 survey. The chest-film follow-up statistics were not completed.

18. *Center activities.* The health nurse serves in an advisory capacity to the Center's nursery. The health nurse confers with chiefs of services and attends professional conferences on the same basis as social service workers and psychologists.

19. *Liaison maintained.* Contacts which result in additional services for our patients are maintained with the District of Columbia Health Department, U. S. Public Health Service, District of Columbia Visiting Nurse Association and Visiting Nurse Association of adjacent areas, Montgomery County Health Department, and United Community Service.

PROGRAMS PLANNED AND UNDERWAY

Programs planned and underway are:

1. Home Care Program—to be extended to include all services of the hospital.

2. Diabetic Education Program—individual and group instruction.

3. Arthritic Education Program—individual and group instruction.

4. Mental Hygiene Program—to be started by the Neuropsychiatric Department in the form of child-study groups.

5. A Child Development Service—to present a series of seven films on "Child Development" during the lunch-hour film program.

6. Research in the study of prenatal influences as they relate to the mental stability of the child has been added to the Health Nurse Program in conjunction with personnel from the National Institutes of Health.

SUMMARY

The Army health nurse is a valuable asset to patient care. The services performed or offered are limited by the personnel and facilities available. The outline of the organization and the pro-

gram of the Army health nursing service at Walter Reed Army Medical Center serves only to show the potential service available. The pattern of service used is unimportant, but it must embrace the essential elements of a sound preventive medicine program, which is equally important at Army Class I, II, and III installations. This program not only saves the physicians' time and reduces the number of patient hospital days, but also supplies nursing service and health education. The health nursing service is centered in the outpatient service as a focus of operation.

THE MAGIC T. I. D.

"An example of the survival of magic in the medical routine of today is the ritual of giving drugs three or four times a day. This ritual, as a Swedish psychiatrist, Ada Glynn, commented on not long ago, has been handed down to us from the time of primitive medical magic. For the medical historian, this custom of giving drugs three or four times daily is associated with primitive belief in the power of certain mystic numbers. The ancient Egyptians believed in a four-day cure. On the island of Eddystone every form of therapy lasts four days and sometimes is repeated for four days every month for four consecutive months.

"If we were to study pharmacologically the advisability of giving certain drugs three or four times a day and take into consideration the duration of the effect of each dose, we should see with surprise that in many cases there would be an overdosage and in others an underdosage, entailing in either case a great risk. Just the same, physicians continue to follow the practice of the three daily doses.

"The administration of a drug is maintained within a certain margin of therapeutic dosage. But patients with totally different constitutions are given exactly the same dose. If the desired effect is not achieved, another drug is tried, when actually what should be done is to determine the correct dosage required by each patient before deciding—in cases of poor toleration—that it should be discarded. The magical formula of *t. i. d.*, regardless of the patient's capacity to absorb or excrete the drug, sometimes makes the patient intolerant to drugs administered at short intervals."

—FELIX MARTI-IBANEZ, M. D.
in *Antibiotic Medicine*
p. 406, July 1955

SUPPLYING BLOOD FROM A DONOR CENTER TO OTHER BLOOD BANKS

JOHN J. ENGELFRIED, *Commander (MSC) USN*

THE BLOOD DONOR Center of this hospital began supplying whole preserved blood to the blood banks of all naval activities of the Eleventh Naval District on 1 April 1954. Because this activity had an excellent source of donors it was anticipated that this task could be performed satisfactorily with very little additional expense, resulting in a considerable financial saving to the other naval activities.

Arrangements are made with the other participating blood banks assigning each one the responsibility of transporting by automobile their blood requirements and of maintaining a list of emergency donors. Specific days are assigned for each blood bank to obtain their routine requirements. This donor center, however, is notified in advance, by letter or by telephone, as to the requirements for each delivery in order that the blood can be selected and packed for transportation, preventing any possible delay. Emergency requirements of the participating activities are supplied, if available, at any time.

Twenty-four unit blood-shipping cases are chilled previously in a walk-in refrigerator. A container of ice is transferred to the shipping case at the time of transportation. An attempt is made to furnish the other banks with recently obtained blood, preferably not more than 3 to 4 days after drawing. Each activity submits a monthly report showing the units of blood received, the unsatisfactory blood received, the cause of rejection, and any errors detected in typing the blood.

RESULTS

During this 12-month period the Blood Bank of the U. S. Naval Hospital, Corona, Calif., received 2,015 units of blood, which were transported about 105 miles. Twenty-six units, or 1.29 percent, were unsatisfactory. Sixteen (1.41 percent) of the 1,131 units shipped about 52 miles to the Blood Bank at the U. S. Naval Hospital, Camp Pendleton, Calif., were reported as unsatisfactory.

Only one of the 343 units transferred to the Blood Bank at the Family Clinic at the North Island Naval Air Station was

From U. S. Naval Hospital, San Diego, Calif.

reported as unusable. The distance of transportation to this activity is about four miles, requiring at least 20 minutes because of a ferry trip across the San Diego Bay.

A total of 3,489 units of blood was furnished to these three blood banks of which 43, or 1.23 percent, were unusable (table 1). Forty of these units were rejected because of increased hemolysis of the red blood cells, detected either at the time of delivery or after storage. This hemolysis could have been the result of transportation. The other three units were rejected for the following reasons: the first was due to the loss of vacuum in the bottle, the second was caused by contamination, and the third was due to excess lipids present in the supernatant plasma.

TABLE 1. *Total blood supplied to all naval activities*

Month and year	Units shipped	Units of unsatisfactory blood			
		Hemolyzed blood		Other cause for rejection*	Total
		When received	After storage		
1954					
April	343				
May	204		1		1
June	273	7			7
July	268	1	1		2
August	348	2	2	1	5
September	279				
October	281	2	1		3
November	281		1	1	2
December	267		6	1	7
1955					
January	348	1	1		2
February	277	3	3		6
March	320		8		8
Total	3,489	16	24	3	43

*One, loss of vacuum in bottle; one, excess lipids present in supernatant plasma; and one, contaminated.

The temperature within the shipping cases at the time of leaving the donor center and again at the time of arrival at their destination was recorded on several occasions to determine if any excessive rise of temperature occurred in transit. It is of interest to report that on one of the warmest days in September 1954 the temperature within one shipping case on leaving this activity at 1218 hours was recorded as 1° C. When this case was opened at 1505 hours (2 hours and 45 minutes later) the

recorded temperature was 6° C. Furthermore, no hemolyzed blood was reported during the month of September from any of the other three participating activities.

SUMMARY

The Blood Donor Center at the U. S. Naval Hospital, San Diego, Calif., has been supplying whole preserved blood to all naval activities of the Eleventh Naval District. The results show that it is practical and economical in the military service for one large donor center having an adequate supply of donors available to draw and process the blood requirements for the entire district. The blood can be transported a considerable distance, by automobile, with a minimum loss of quality due to hemolysis of the red blood cells.

EVACUATION BY HELICOPTER

In the recent Korean campaign, the lessons of which are being studied here and in the U. S. A., evacuation has been further speeded and eased by means of helicopters, which have proved far superior to the stretcher-jeep and mule. Evacuation by this method has no doubt been one reason for the remarkably low death rate of the American wounded (2 to 3 percent, compared with 4 to 5 percent in the second world war); and the U. S. Army Medical Service has decided to include the helicopter ambulance unit as an integral part of its full organization. The helicopter, however, is useful only in suitable weather and, as in Korea, with undisputed mastery of the air—conditions that will not necessarily prevail again.

—EDITORIAL
in *Lancet*
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MILITARY MEDICINE IN PEACETIME

Some Unusual Cases

JOHN CONLEY, *Lieutenant (MC) USNR*
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IN VIEW of the rather widely held opinion that medical services in the field have little or no medical work of value to do following cessation of hostilities, the following case reports are presented in refutation. These cases were all handled successfully entirely within the Western Pacific field installations of the First Marine Division's Medical Battalion.

CASE REPORTS

Case 1. A 24-year-old Korean man complained of weakness and numbness of both legs. For 4 months he had noted progressive weakness and loss of sensation in both legs with loss of bladder and rectum control. His gait became unsteady, finally resulting in an inability to walk. During the same period he also had noted moderate shortness of breath and a frequent cough productive of foul-smelling sputum. One month before onset he had been treated for pleurisy; peritonitis had been suspected 6 months earlier.

Physical examination revealed some distention of the abdomen, with a moderately enlarged liver. Neurologic examination showed a spastic paraplegia with loss of tactile sensation in both legs. The rectal tone was poor. Laboratory studies revealed normal blood and urine. The stool was positive for ascarides and *Trichuris trichiura.* A roentgenogram of the chest showed pneumonic infiltrate in both right and left midfields of the lungs. Myelitis at the level of T-4, cause undetermined, was suspected.

A laminectomy was performed on 23 October 1953 at the level of T-4. In the epidural space, centered in the midline, was a granulomatous mass with a center consisting of black oily liquid; this granuloma was excised. Numerous cysts of *Paragonimus westermani* were found.

Four days postoperatively a pleural effusion developed that proved to be sterile. Recovery was uneventful; 2½ months after operation there was return of sphincter function, motor power, and sensation, and the patient was able to walk without difficulty.

From Medical Battalion, 1st Marine Division (Reinf) FMF Pacific, FPO San Francisco, Calif. Dr. Conley is now at 1111 N. Broadway, Santa Ana, Calif.

Case 2. A 13-year-old Korean boy sustained an injury from a bicycle chain 3 weeks prior to admission. The injury was a small abraded area on the heel which was not cleansed or dressed. Five days before admission he developed pain about the face, neck, and abdomen, and began to have difficulty swallowing. For 4 days he had convulsions and increasing trismus. He was then treated by a Korean doctor, being given three injections, but failed to improve.

Physical examination revealed a well-developed and well-nourished Korean boy who appeared acutely ill. Temperature was 100.2° F.; pulse, 120 per min.; and blood pressure, 110/60 mm. Hg. The child's face was flushed, he was unable to open his mouth, and the upper lip was tightly drawn over the upper teeth, giving the appearance of typical risus sardonicus. The neck and abdomen were rigid, all muscle groups were spasmodic, and opisthotonos was severe. The patient was conscious but highly excitable. He was then having recurrent contractions of various muscle groups but no true convulsions. The skin was covered with giant urticaria, which had developed after the injections given before admission. The remainder of the examination was negative except for a dirty ulcer about 4 by 4 cm. on the lateral part of the left heel. The left inguinal lymph nodes were enlarged and tender.

The patient was admitted with a diagnosis of tetanus. Laboratory studies showed the red blood cell count to be 2.26 per cu. mm., and the hemoglobin to be 64 mg. or 9.5 grams per 100 ml. The white blood cell count was 6,550 per cu. mm., with a normal differential. Findings of a urinalysis were within normal limits. A lumbar tap revealed the spinal fluid to be crystal clear with normal dynamics; there were no red blood cells and 6 white blood cells. Sugar was 82.5 mg.; protein, 20 mg.; and chlorides, 725.4 mg.; all per 100 ml.

The patient was given a sedative. The wound was widely excised and debrided, and continuous hydrogen peroxide packs were started. Crystalline penicillin, 180 mg. (300,000 units) were given every 2 hours, and intravenous infusions were started. Because a skin test with horse serum was strongly positive, the patient was given 50 mg. of cortone (brand of cortisone acetate) intramuscularly, and was slowly desensitized. He was then slowly given 40,000 units of tetanus antitoxin intravenously without any untoward reaction. After the intravenous infusions the patient seemed to be improved, although his condition remained critical. The following day he appeared to be definitely improved, although the accumulation of thick mucous secretions in the pharynx remained a problem, and on two occasions almost necessitated a tracheotomy. Improvement was gradual but steady. The muscular spasm and rigidity began to subside slowly, but the patient developed a bilateral toxic paralysis of the extensor muscles of the forearm, which slowly improved. Twenty-three days after admission, the patient was in good general condition, and it was believed that the paralysis would completely subside.

Case 3. A 52-year-old Korean woman was admitted on 8 August 1953 complaining of an enlarging abdomen and a mass in the right flank of 4 months' duration. Dull intermittent pain had been noted for 2 months. Other symptoms such as abnormal bowel habits, weight loss, and excess fatigability were denied, as well as any other complaints. The past history was noncontributory, and a family history was not obtained. A review of systems other than that described in the present complaint was negative. More than a year earlier the patient had noted worms in her stools, but had paid no attention to stools since that time.

Physical examination was essentially negative except for the following findings: A large firm mass 10 cm. in diameter was palpable in the left hypochondrium. This extended to the costal margin superiorly and to the midlumbar region inferiorly and laterally; the upper border disappeared beneath the costal margin and could not be palpated. The mass did not move with respiration, but on palpation could be moved through a very limited range (less than 1 cm.). No other intra-abdominal masses or organs were palpable. There was only minimal tenderness over the mass on deep palpations. No lymphadenopathy was found in the usual areas examined. No hernias were present. A clinical impression of carcinoma of the descending colon was formed.

An operation was performed 10 days after admission. The large mass was found to be in the abdominal wall, penetrating through and completely adherent to the splenic flexure of the colon. A wide resection of the abdominal wall was carried out, including the 11th and 12th ribs and a portion of the diaphragm; the splenic flexure of the colon was widely resected and an end-to-end anastomosis performed. Complete abdominal exploration failed to reveal any further intra-abdominal abnormality. The abdominal wall and diaphragm were closed—the former by swing flaps of the anterior rectus sheath. No attempt was made to approximate the peritoneum because it had been widely dissected and removed. Steel wire sutures further closed the defect. The patient received 1,000 ml. of whole blood during the procedure. Her postoperative convalescence was sustained without incident. She was discharged 2½ weeks later and followed up at the outpatient clinic. Subsequent postoperative barium enema roentgen studies have been negative, and to date the patient is well and uncomplaining. Microscopic examination of sections of the removed tissue revealed a desmoid tumor which was intimately attached to the colon.

Case 4. At 0330 hours on 17 October 1953, this 17-year-old man was shot with an M-1 rifle. When brought to "E" Medical Company at 0400 hours, examination revealed a compound, comminuted, supracondylar fracture of the right humerus and what appeared to be a superficial wound of the right flank region. He was not in shock, blood pressure and pulse were stable, and there was no evidence of artery or nerve involvement. A roentgenogram of the chest was essentially normal. A roentgenogram of the right arm confirmed the gross findings.

Under brachial block the arm was debrided, the triceps tendon sutured, and a pin placed through the medial condyle. When the patient was rolled on his left side and the right arm was elevated for debridement of the flank wound, the characteristic sounds of a sucking-type chest wound were heard. The entrance wound was located at the right paravertebral margin in the 12th interspace and the exit wound at the 10th interspace at the anterior axillary level. The wound edges were infiltrated with 1 percent novocain (brand of procaine hydrochloride); the 10th rib was exposed and a 4-inch section removed. Examination then revealed that the upper third of the right kidney and the lateral sixth of the right lobe of the liver had been destroyed, and there was a rent in the right diaphragm measuring about 2 cm. in length.

In spite of the opening of the right thorax, the patient's condition remained stable. He was given 75 mg. of demerol (brand of meperidine hydrochloride) intravenously, and the surrounding tissues of the wound were infiltrated with 1 percent novocain. The distal third of the right kidney was resected and the capsule closed with interrupted sutures of 000 chromic. The involved portion of the liver was resected and and bleeding controlled with mattress sutures of 0 chromic. Examination of the lung revealed only a contused right lower lobe. A chest tube was inserted through a stab wound in the anterior seventh interspace and connected to underwater drain. The diaphragm was closed with interrupted sutures of 00 silk. The intercostal muscles were closed over the right pleural defect. Drains to the suprahepatic area and right kidney were brought out through an infradiaphragmatic stab wound in the right flank. The right arm was placed in a right-angle splint. The patient's blood pressure, pulse, and respiration remained stable throughout the operation.

A small amount of bile drained through the flank wound for the first 2 postoperative days. A roentgenogram of the chest taken on the second postoperative day showed the right lung almost completely expanded and the right diaphragm in normal position. On the fourth postoperative day secondary closure of the wound was done. Subsequently, all routine laboratory examinations were within normal limits and the patient was in excellent condition.

This case was thought to be somewhat unusual in that a rather extensive wound of the right flank involving the kidney, liver, and lung was masked by the musculature of the thoracic cage, keeping the wound sealed until the arm was elevated. Secondly, it demonstrated the type of major operation that could be accomplished under local anesthesia, which while not advocated was adequate under the circumstances.

SUMMARY

Four unusual cases were observed as part of the day-to-day professional care given by a Marine Division Medical Battalion in peacetime. These included paragonimiasis, tetanus, desmoid tumor, and an unusual flank wound. This is only a small sample of a diagnostically and therapeutically challenging practice.

Clinicopathologic Conference

U. S. Air Force Hospital, Wright-Patterson Air Force Base, Ohio*

DECOMPRESSION SICKNESS

[*In view of the interest in this unusual case, the customary style of a clinicopathologic conference has been changed to a modified panel discussion.*]

Summary of Clinical History. At 0825 hours on 19 March 1954, a 34-year-old obese Army officer was admitted by ambulance from the flight line with acute semicoma and left hemiplegia. Weighing 250 pounds and 5 feet 11 inches tall, the officer flew as a passenger in a T-33 jet aircraft leaving Langley Air Force Base for O'Hare Air Force Base. The patient had been briefed concerning the oxygen system and other safety devices in the aircraft. There was no preoxygenation prior to take off. Take off and climb to 5,000 feet were executed on 100 percent oxygen. At this altitude the oxygen was turned back to "normal" system. Climb to 35,000 feet on course was accomplished by 0845 hours. The pressurized cabin altitude at this time was 26,000 feet. The pilot checked his passenger frequently and received lucid verbal responses until arrival over Wright-Patterson Air Force Base at 1005 hours, where the pilot had to change course and altitude. Ascent to 39,500 feet (cabin altitude 29,000 feet) above the clouds was completed in 3½ minutes, at which time the pilot noticed that the throttle was "jammed" and asked his passenger to check it on the rear instrument panel. The officer replied that it was all right, but complained of numbness on the left side and coldness. He was advised to loosen his harness, turn the oxygen to 100 percent, and check the pressure parts. The patient replied he could not see the last-named even though told where they were. On further questioning it became evident to the pilot that his passenger was becoming progressively more incoherent.

These events occupied about 2 minutes at a cabin altitude of 29,000 feet. The pilot called a May Day emergency and started

Col. Herbert W. Coone, USAF (MC), Commander. From the Medical Service, Col. Coone, Chief.

down, reaching 10,000 feet in less than 5 minutes and landing in a total of 20 minutes from the time of onset of his passenger's symptoms. On landing the patient was unconscious and evidently had been so for some time because the pilot could feel the man's weight on the controls. The onset could therefore be placed roughly between the time of "jamming" of the throttle and loosening of the patient's harness. On landing, oxygen equipment and cabin pressurization were checked and found to be in good operating order.

Recapitulating the time element: The patient was taken to a 26,000 feet cabin altitude in 20 minutes and ascended to 29,000 feet cabin altitude over a 3½-minute period. Exposure at this altitude for 2 minutes coincided with incoherence, numbness, visual disturbance, and loss of consciousness. Return to 10,000 feet was accomplished within 5 minutes and landing in 20 minutes after onset of symptoms.

Physical Examination. The pilot, the corpsman, and the ambulance physician described a red, livid, obese, semicomatose white male who exhibited right-sided convulsive movements in the ambulance, but a flaccid paralysis of upper and lower left extremities. The patient was extremely restless and required restraint. Blood pressure was 180/120 mm. Hg; pulse, 130 per minute; respirations, 40 to 50 per minute. On the ward, blood pressure fell to 130/90 mm. Hg. Pupils of the eyes were regular, equal, and markedly dilated (to about 7 mm.); fundi were normal, with no papilledema. Tonus of cervical muscle was subnormal. There was tachypnea with pronounced abdominal excursions, but no positive findings in the lungs. There were no heart murmurs, and regular tachycardia was present. The back and extremities showed no signs of trauma. The head and thorax were similarly free from gross signs of injury. Neurologic examination showed flaccid left-sided paralysis, right-sided hyperreflexia, and hypertonicity. The Babinski sign was not elicited. No other localizing neurologic signs emerged.

Laboratory Studies. Examination of cerebrospinal fluid revealed an initial pressure of 112 mm. of water; no block was demonstrated. Fluid was crystal clear and contained 4 neutrophils per cu. mm. and a total protein of 90 mg. per 100 ml. The serologic test for syphilis was negative.

Course in Hospital. Initial clinical impression was to rule out ruptured cerebral aneurysm, but air embolism-decompression disease was suspected. Immediately on admission to the ward, the patient was placed on oxygen by mask. Because he was breathing so rapidly that there was some rebreathing and incomplete filling, this was changed to oxygen by nasal catheter. Spinal fluid pressure rose with pressure on either jugular vein and fell

rapidly on release. The anesthesiologist attempted stellate block on the right, which did not produce a Horner's syndrome but somewhat increased warmth of the right upper extremity.

On neurologic re-examination, the superficial abdominal and cremasteric reflexes were unelicitable, and the tonus of the extremities of the right were decreased. The consulting neurologist was telephoned, but in view of lack of a greater degree of localization did not recommend further immediate treatment.

The patient developed a pronounced terminal respiratory-tract exudate requiring aspiration, and developed a peripheral vasomotor collapse with blood pressure of 0/0, bluish mottling of skin due to stasis, and imperceptible pulse. Intravenous levophed (brand of levarterenol bitartrate) made with a 16 ml. solution in 1 liter was given with no significant response, and the patient died at 1555 hours—4 hours and 55 minutes after admission to the ward, and about 5 hours and 25 minutes after onset. Total dose of levophed received before death was 8 ml.

DISCUSSION

Doctor Marshall:* When a patient presents symptoms such as these after an airplane ride, the number of things that we can reasonably consider are actually very limited. I am sure that there are a number of things that you could bring up that are on the back page of the textbooks. However, if you are going to find the most reasonable causes, I think that intracranial hemorrhage of one type could be the most likely thing other than decompression sickness to consider. I think this is pretty well ruled out by the fact that the man had no meningismus; he had a normal spinal fluid pressure. The spinal fluid was clear and there was no papilledema. I am sure that I am working too much towards bends—I can't give a fair differential diagnosis. Maybe someone else would like to say a few words about the differential diagnosis.

Doctor Downey:** You might wonder whether the altitude of the cockpit, which was 26,000 feet for 1 hour and 20 minutes, would be sufficient to cause decompression sickness. I know of only one case of decompression sickness on record that occurred at an altitude of 26,000 feet. This case will be the second as the altitude was the same except for that brief interval when the pilot went to a cabin altitude of 29,000 feet. When he went to 29,000 feet, it did not take but a very few moments for severe symptoms to ensue in the patient. I think that the differential diagnosis in the hospital of ruptured aneurysm of the circle of Willis vs. decompression sickness was good. At the time Doctor Coone saw the patient he reversed the order,*** which was also quite proper because

*Maj. Charles B. Marshall, Jr., USAF (MC), Resident, Aviation Medicine.

**Lt. Col. Vincent M. Downey, USAF (MC), Staff, School of Aviation Medicine, Randolph Air Force Base, Tex.

***Dr. Coone was the first originally to suggest the diagnosis of decompression sickness. The working diagnosis previously was subarachnoid hemorrhage.

he then had a clear spinal fluid to his advantage. Decompression sickness was now the preferred diagnosis, and some intracranial hemorrhage, from whatever cause, the alternative. There are some rare differentials, and I think syphilis should also be mentioned. This seems a remote possibility in this case. The man was young with no evidence of vascular lues. He was an Army officer and subject to frequent serologic testing.

Doctor Johnston:* What do you think of the possibilities of a pheochromocytoma or islet cell adenoma of the tail of the pancreas for instance. These should represent an academic brace of possibilities in the differential diagnosis.

Doctor Downey: I think pheochromocytoma is a good possibility. I am surprised we have left it to the pathologist to suggest that one. You remember that his blood pressure was 180/120 mm. Hg—way up in the abnormal range—as a matter of fact, high for decompression sickness. There is a blood pressure rise but usually of the order of 150 to 160 mm. Hg systolic and something well below 120 mm. Hg diastolic. I don't think I know of any other that went to 120 except one other case that was a duplicate of this case and that happened on 25 January 1953. A colonel in the Air Force was also a passenger in the back seat of a T-33 jet aircraft and was in transit less than 4 hours. I don't know where the flight was to, but over Alexandria he developed cerebral symptoms and actually looked a great deal like this—had a hemiparesis; the pilot realized that the man was in difficulty and landed immediately. They got him to the hospital, where he promptly died, very much like this patient, and autopsy also showed air embolism. There are perhaps only two cases other than this third man that I know something about, so I don't think decompression sickness stands as the initial diagnosis when we know of only three cases. There are more cases in the literature.

Doctor Johnston: To summarize the gross autopsy findings which I am now going to illustrate: This man, as far as we could see at the autopsy table, had pulmonary edema and congestion that caused his lungs to weigh 1,000 grams when about 500 to 600 grams would have been a reasonable weight. His heart weighed 325 grams, well within the normal limits, and showed no gross abnormalities except for two lesions. The first was a small atheromatous plaque of a marginal branch of the left coronary artery, causing about 60 percent occlusion. As far as we could judge anatomically, there was quite a great deal of collateral circulation about this plaque, so I do not think that it played a significant part in the patient's death. The second abnormality was a patent valved foramen ovale. It had an opening that approximated 1.5 cm. on the left side of the heart, against which the valve was oriented. There was congestion of the liver and spleen. The remainder of the gross autopsy was not remarkable. The autopsy, performed about 1 hour after death, was carried out entirely under water. We had the fanciful hope of being

*Capt. Austin D. Johnston, USAF (MC), Chief, Laboratory Service Branch.

able by this means to demonstrate intravascular or interstitial gas bubbles, but this proved to be entirely in vain. There were no gross lesions on section of the brain. Microscopically, however, numerous ischemic foci, which I will demonstrate, were found in the anterior commissure, the septum pellucidum, head of the caudate nucleus, basilar portion of the pons, and the cerebellum, as well as a number in the cerebral cortex. A few perivascular petechiae were also demonstrable in some of these areas. There were conspicuous perivascular hemorrhages in the floor of the fourth ventricle at the midpontile level. All of the important work in establishing the diagnosis of this autopsy was done in Washington by Doctor Webb Haymaker of the Armed Forces Institute of Pathology. Nerve cells and myelin sheaths suffered greatly in the areas of injury. There were lymphocytic foci of inflammatory reaction in the pars basilaris pontis.

We did not remove the entire spinal cord; however, the cervical portion of the spinal cord was available for study, and you can see that there is an almost explosive injury to myelin sheaths and ganglion cells in the ventral horn (figs. 1 and 2). The lesions in the cerebellum and cerebral cortex are illustrated in figures 3 through 5. In addition, we found numerous fat emboli in the lung (fig. 6) and a few scattered fat emboli in the brain (fig. 7).

Now, you might ask, why stain these tissues for fat? We did so because we thought of intracellular gas bubbles in fat (and our particular preference is the bone marrow) that rupture cells on expansion and release their contents into the sinusoids surrounding the fat cells in bone marrow. They could be transported thence to the lungs and through the patent foramen ovale into the brain. The alternating possibility that fat emboli could filter through the lungs is supported by the fact that only two fat emboli were found in many sections of the brain. As to the pathogenesis of the ischemic foci in the brain, we envision these to be the result of intravascular gas emboli combined with vasospasm. We have no simple explanation for the vasomotor phenomena in this patient —hypertension followed by shock—nor of mydriasis, tachycardia, and tachypnea. We would like to relegate these to the province of the physiologist. If there aren't any questions about the pathologic findings, I shall ask Doctor Schwarz to proceed with an explanation of the bubble formation.

Doctor Schwarz:* The pathologic findings of the case presented to us suggest a diagnosis of intravascular fat emboli. In the absence of gross body trauma, we must ask ourselves the origin of such fat emboli. Rupture of fat cells, presumably secondary to the formation and extension of large bubbles within the cell, seems the most probable mechanism. We should, therefore, concern ourselves with two questions: (1) The origin of intracellular gas bubbles as a complication of high-altitude flight, and (2) the reasons that bubbles occur primarily in fat tissues.

*First Lt. Marvin J. Schwarz, USAF (MC), Physiology Branch, Aero-Medical Laboratory.

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Bubble formation represents a process by which gases in supersaturated solution within the cells may enter the gaseous phase. From the physical standpoint, we must differentiate two processes—one of bubble formation, the other of bubble expansion. It is a well-known physical phenomenon that gases may exist in supersaturated solution until some stimulus or "nucleus" for bubble formation is found into which the gases can rapidly diffuse.

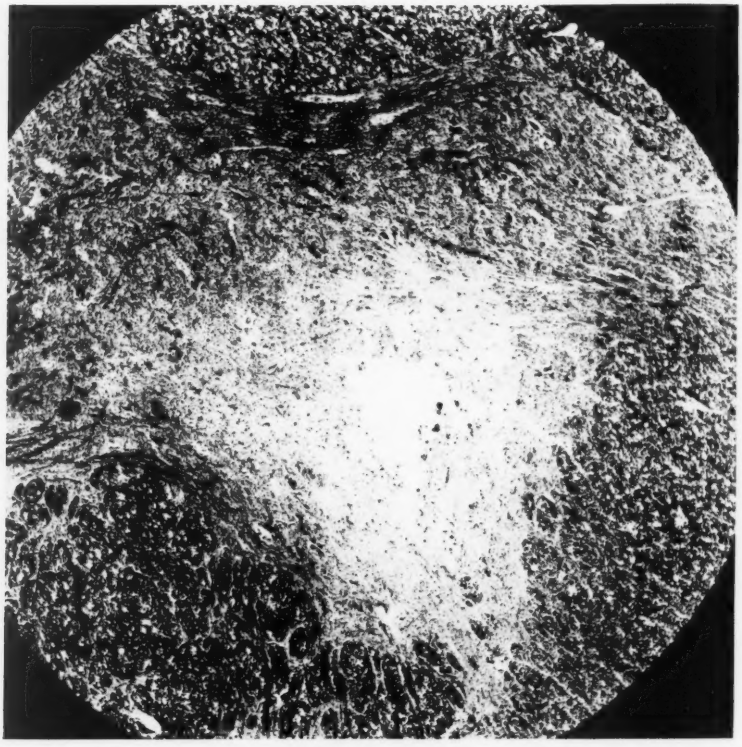

Figure 1. Destructive area in ventral horn of superior cervical segment of spinal cord. The significance of this change is uncertain. There is little associated hemorrhage. The lesion was bilateral at this level. (Lillie stain, × 45)

Now, what is the mechanism of supersaturation? The answer lies in the differences in the partial pressures of inert gases in the biologic system as one ascends. The biologic elimination systems, namely, the circulation and the lungs, are unable to eliminate the body's nitrogen stores at a sufficiently rapid rate to keep pace with the decrease in partial pressure of nitrogen in the surrounding atmosphere as one ascends in modern flight. The result is that the person who rapidly ascends to high altitudes may find his tissues supersaturated with nitrogen when compared to the surrounding atmosphere. It is this difference in pressure which is responsible for the initiation of bubble.

It would appear that we may divide the body into several apparent segments, physiologically speaking. The lungs are in active contact with the outside atmosphere and thus rapidly give up their nitrogen. There is almost no lag of any alveolar nitrogen content with respect to the outside atmosphere, regardless of the rapidity with which one ascends. The aqueous circulatory system appears to lag only slightly behind the lungs. Presumably any area of the body adequately perfused by the circulatory system should be capable of giving up its quota of

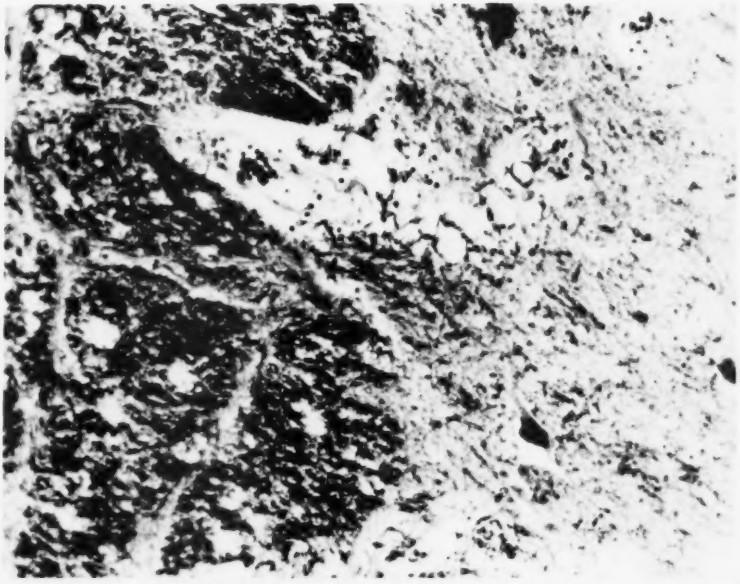

Figure 2. Higher magnification of area from figure 1, showing distended and ruptured myelin sheaths. Axon swelling was also demonstrated by Bodian stain. Ventral horn cell in upper right portion of the field. (Lillie stain, × 250)

inert gas with a relatively small lag. There are, however, certain areas of the body which have relatively poor circulation and, therefore, do not have free exchange of dissolved nitrogen with the nitrogen of blood. The most significant example of this is fat tissue.[1] Nitrogen is far more soluble in the lipid system than in the aqueous. A considerable volume of literature shows that there is approximately five times as great a solubility of nitrogen in fat as in the aqueous system. The literature further indicates[2,3] that fat tissues of the body consequently give up their nitrogen extremely slowly.[4]

The end result is that the individual who ascends, as this Army captain did, may build up large amounts of nitrogen storage in the fatty tissues. The greater the amounts of fatty tissue in the body in proportion to other tissues, the greater the degree to which this can occur. If such supersaturation becomes sufficiently great and the conditions

Figure 3. Ischemic areas in cerebellum. Note widespread focal destruction of granular layer. The latter is intact for a considerable interval in the upper left portion of the field. (Lillie stain, × 48)

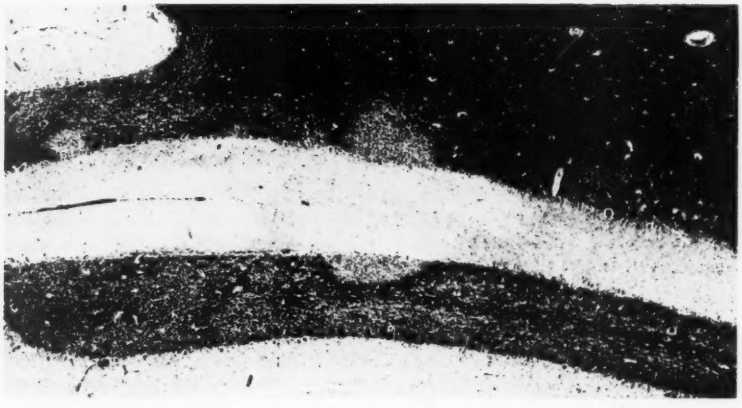

Figure 4. Foci of demyelination and ischemic change in cerebellum involving gray and white matter. (Lillie stain, × 27)

are possible for bubble formation, bubbles may occur within those cells that are the most supersaturated, namely, the fat cells.

Considerable work has been done in this problem of nitrogen elimination, and rather complex curves of elimination rates have been obtained.

Figure 5. Ischemic changes in cerebral cortex. No laminar distribution of lesions was observed such as might argue anoxic pathogenesis. (Lillie stain, × 8)

These tend to show that nitrogen is not eliminated according to a single exponential term, as might be expected if one were dealing with a single simple system (all parts of which are in equilibrium with each other and in which nitrogen leaving the system is independent of the

actual amount of nitrogen present, but at any given instant is a function of the total amount present). Rather than such a simple relationship, it appears that the body elimination curves that have been found do support the concept that the body consists of several systems, each of which is in contact with the other. There is some lag of exchange. The end result is that most descriptions of the body's elimination of nitrogen consist of several exponential terms.[1]

I hope this brief summary conveys to you some of the principal concepts involved. For those who are interested in this extremely important problem in modern aviation medicine, I would like to refer you to an excellent, complete, and relatively nontechnical report dealing with the subject of decompression sickness. This report is published under the auspices of the National Research Council under the editorship of the committee headed by Dr. John Fulton. I would like to close by pointing out that this problem of tissue supersaturation with gases, bubble formation, bends, and related syndromes is one of considerable significance to those of us working in the field of high-altitude flight and physiology. We may rightfully anticipate that it will become more and more a technical problem faced by armed services personnel the world over as high-altitude aircrafts become more and more commonplace.

Mr. D. A. Rosenbaum:* Since we seem to be pointing to the idea that bends was the cause of this man's death, it might be right at this time to enumerate some of the common and accepted symptoms of bends. The first symptom of bends is deep pain, particularly in the shoulders and knees, and then in other joints. Chokes may ensue, which is a chest pain, difficulty in breathing, and a subjective sensation of burning in the lungs and uncontrolled coughing. There may be blurred vision and the patient may have blind spots. Paralysis is possible, as is loss of consciousness, either dependent on or independent of the pain from the bends area. So, with this short list of symptoms, I would like to talk on the environmental and constitutional factors that play a part in bends. I am taking this from a report by Motley and associates,[5] who examined the training records of some 68,000 trainees during the last war. Under environmental factors, they found that the time of the day played a part in the incidence of bends. The earlier in the day, the greater the incidence of bends. As the day progressed, the incidence of bends decreased. There was no correlation with the day of the week, the month, or the year. The temperature of the chamber definitely had an influence on the occurrence of bends—the colder the temperature, the more frequent the occurrence of bends. As for anoxia—quite often we think that perhaps anoxia or hypoxia may be associated with bends. There is no correlation between hypoxia and bends. In those individuals studied who deliberately were made hypoxic, the incidence of bends was no greater than in those who were adequately oxygenated. Now, some of the constitutional factors: Certainly, the larger the man, the greater his susceptibility to bends. Height of the individual, yes—the

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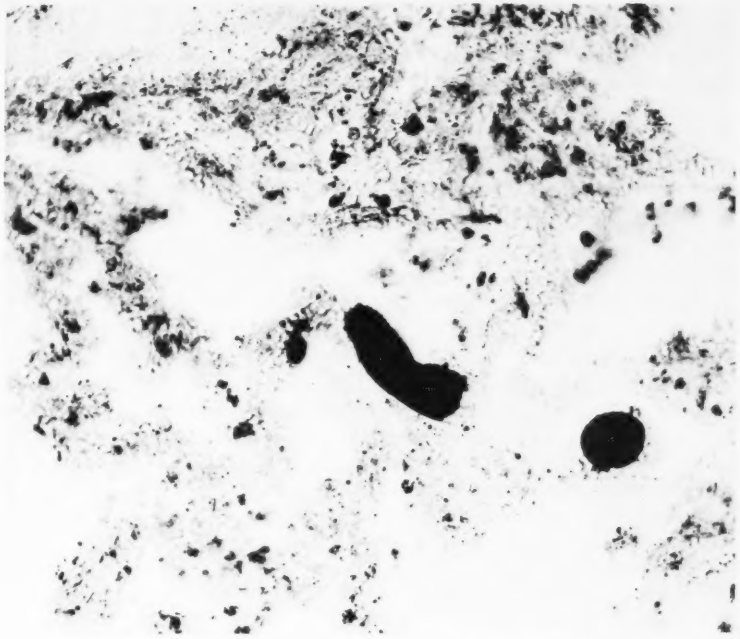

Figure 6. Fat emboli in pulmonary arteries. (Oil red O stain, × 130)

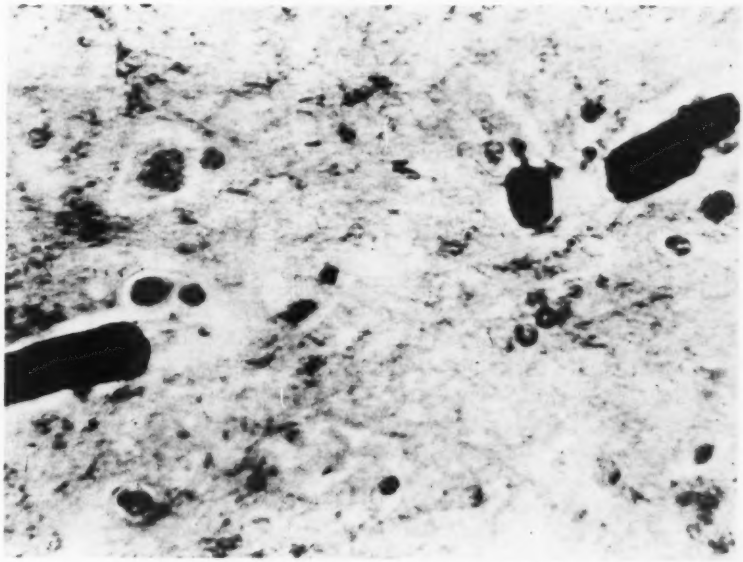

Figure 7. Fat emboli in cerebral vessels. (Oil red O stain, × 200)

taller the individual, the greater the susceptibility to bends. However, this is probably due to the fact that a taller individual is also heavier. Weight, yes, definitely—the heavier the individual, the greater the susceptibility to bends and the more severe the bends. Weight by itself, however, is a poor yardstick to use. They use here linear density, that is, height in inches compared to weight in pounds. We are suggesting in our laboratory the use of specific gravity, that is, the amount of fat to body weight ratio as a test.

Now, what are the ways of reducing or preventing bends? First of all, there is cabin pressurization. Doctor Downey and I have evidently read different papers. Henry[6,7] of the University of California in 1953 showed that mild bends will occur at 24,000 feet, moderate at 28,000 feet, and severe at 31,000 feet. Therefore, there is a very good possibility of bends occurring at 24,000 feet. If the cabin pressurization is below 24,000 feet, we should get little or no bends. That is an aircraft problem. Preselection is definitely a medical problem. We have suggested to the Surgeon General's office several items to be included in the physical examination for pressure-suit training for individuals wearing the T-1 or S-2 altitude suit. First of all, we suggested a complete medical history—that is, of both parents and of the individual—and a psychiatric examination and history that should elicit, particularly, the man's feelings about whether he wants to fly at 50,000 feet and whether he wants to wear an altitude suit for several hours or not. Second, a rigid physical examination is necessary. It should be pointed out to the physicians in charge why this physical is so important to the individual, and it should be a separate examination, not a routine one. The weight especially should be checked—that is, the specific gravity of the individual, the amount of fat to body weight ratio. We would suggest roentgenograms of the chest, particularly noting heart size and any fat deposits in and around the heart. We would like an electrocardiogram. If there is any abnormality or suggestion of abnormality, a cardiovascular test should be used. If any abnormalities show up, no altitude training should be given that individual.

Preoxygenation is probably the one most commonly used in the Air Force—that is, prebreathing 100 percent oxygen before ascent to altitude in an attempt to wash out the nitrogen in the body. Studies have been made to show that there is a break in the nitrogen elimination curve in 1 to 1½ hours. In recent tests we have found that 1 to 1½ hours is the optimum. We have been using 2 hours of preoxygenation before any ascent to altitude above 43,000 feet, and we have found that that eliminates bends almost completely. The T-1 altitude suit is devised primarily to protect against hypoxia. It will give the individual a 1- to 2,000-foot higher altitude before the onset of bends, probably because of the pressure reserved by the suit itself, but that does not mean that the man who does not get bends at 31,000 feet can put on the pressure suit and go to 33,000 feet.

COMMENT

The possibility that anoxia might be responsible for the lesions seen in the brain is considered to be well ruled out by both clinical and pathologic observations. There was no cyanosis during continuous observation. The oxygenation system of the aircraft was thoroughly checked as well as all equipment such as oxygen mask, et cetera, and reports indicate that these were in good order. The pilot experienced no symptoms. Fat embolization has not been reported in association with fatalities from diver's decompression sickness. There is no record of its being searched for. Fat embolization has, however, been demonstrated in six or seven persons dying from decompression to altitude in decompression chambers.[8]

Further discussion with the physiologist indicated the line of thought that vasomotor phenomena observed in these cases might be the result of "vasovagal reflexes." Experimental work in the Aeromedical Laboratory of Wright-Patterson Field tends to support this suggestion. Preatropinization of dogs subjected to high-altitude decompression has resulted in an encouraging diminution of these manifestations. This work is soon to be published. As aircrafts fly ever higher, the problems of decompression sickness in relation to susceptibility, prophylaxis, and treatment will become of increasing importance. It is in the hope of exciting interest and calling attention to these problems that this case has been presented.

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CASE REPORTS

Echinococcus Disease in an American Veteran

SAMUEL ZELMAN, M. D.

ECHINOCOCCUS infection is rarely seen in the United States, except in the foreign-born from endemic regions, chiefly the Mediterranean area, South America, and New Zealand. It is acquired by ingestion of food contaminated with dog feces containing the ova of the dog tapeworm *Echinococcus granulosus*. The dog acquires infection by eating the infected liver or other tissues of the intermediate host, most often sheep, in which encysted scolices are present. Cysts are of slow growth over many years, and occur most commonly in the liver (65 percent of cases), but have been described in many organs. The right lobe of the liver is involved 85 percent of the time.[1] Hypersensitivity to cyst fluid is characteristic of the disease, and fatal anaphylactic shock may follow intraperitoneal rupture of the cyst.[2] This hypersensitivity is employed diagnostically in the antigen skin test and the complement fixation test. Eosinophilia is said to occur after escape of any fluid from the cyst, and is found in 25 percent of patients.[3]

The case here reported occurred in a veteran of World War II who has not been outside the United States except for his overseas service in North Africa, Sicily, and Italy. He landed at Oran, North Africa, on 2 November 1942. About 6 months later, he, and six or seven other men of the 689th Airborne Infantry Division, cleaned out and occupied for a period of 2 months a barn which had housed sheep, near Constantine, North Africa. The area was one given over to grazing sheep, together with shepherds and sheep dogs. The men kept no dog.

CASE REPORT

A 40-year-old laborer was admitted to this hospital on 1 June 1955 complaining of increasing epigastric pressure and aching, worse after meals, with occasional nausea and vomiting, of more than 1 year's duration, accompanied by a weight loss of 14 pounds. He had been hospitalized the previous autumn because of nervousness, characterized as tension, irritability, restlessness, and inability to hold a job, and had been diagnosed as having chronic paranoid schizophrenia. During that hospitalization, he had complained repeatedly of right upper-quadrant aching, because of which roentgenographic studies of the gallbladder and colon had been done but were unrevealing.

From Veterans Administration Hospital, Topeka, Kans.

The past history included spinal meningitis at the age of 7. The patient had served in the Army Airborne Infantry as a private first class from December 1941 to September 1945, with service overseas in North Africa, Sicily, and Italy. He had not otherwise been outside this country. During the year 1944, while in Italy, he had been repeatedly hospitalized for pyodermas and abdominal complaints, with admission diagnoses that included possible duodenal ulcer, gastritis, cholecystitis, lead poisoning, and hysteria, but none of these were substantiated. A transient hemiplegia occurred, which may have been hysteric. Latent syphilis was diagnosed by serologic test in 1942, and asymptomatic neurosyphilis by spinal fluid test in 1945, after which the patient was given penicillin and malarial therapy, and a disability discharge for psychoneurosis, anxiety reaction.

In 1951, while working at an ammunition plant, the patient was struck on the head by a shell box, sustaining a skull fracture, and found unconscious. He was treated at home in bed for 42 days. On the first day out of bed he developed right hemiplegia, for which he was taken to the hospital, and a blood clot evacuated through a burr hole of the left parietal region of the skull. The paralysis gradually cleared over the next 4 months. This was the only hospitalization between 1945 and 1954.

Examination revealed a rounded, firm, smooth, tender mass in the epigastrium, extending nearly to the umbilicus. A flat percussion note was elicited over the mass. The right lobe of the liver was separately palpable at the right costal margin. Examination of blood, urine, and stool specimens revealed no abnormalities. The blood serologic tests for syphilis were weakly positive. The cephalin-cholesterol flocculation and zinc turbidity tests of the serum were normal, but the thymol turbidity was slightly elevated (5.2 units). Bromsulfalein (sulfobromophthalein sodium) retention at 45 minutes (5 mg. per kg.) was 36 percent. Roentgenograms of the digestive tract revealed a large, rounded, cystlike mass in the epigastrium, anterior to the stomach and depressing both stomach and colon (figs. 1 and 2). The shadow of this mass could also be identified in the roentgenograms of the gallbladder area, taken the previous year. Intravenous pyelograms proved negative for polycystic disease.

Believing the mass to represent either an enlarged left lobe of the liver or a mesenteric or liver cyst, and not having considered the possibility of hydatid cyst, I attempted diagnostic needle aspiration on 20 June. Clear watery fluid spurted through the needle under considerable pressure. A liter of fluid was aspirated. The later portions of the fluid showed evidence of freshly admixed blood in small amount, presumably a result of rapid change in pressure. The patient experienced immediate relief of the sense of epigastric pressure. Only the first fluid aspirated was sent to the laboratory, because hydatid cyst was not yet suspected. No scolices or hooklets were found in that specimen of

fluid, which was reported to have a specific gravity of 1.001 and a protein content of 5 mg. per 100 ml. No growth was obtained on culture.

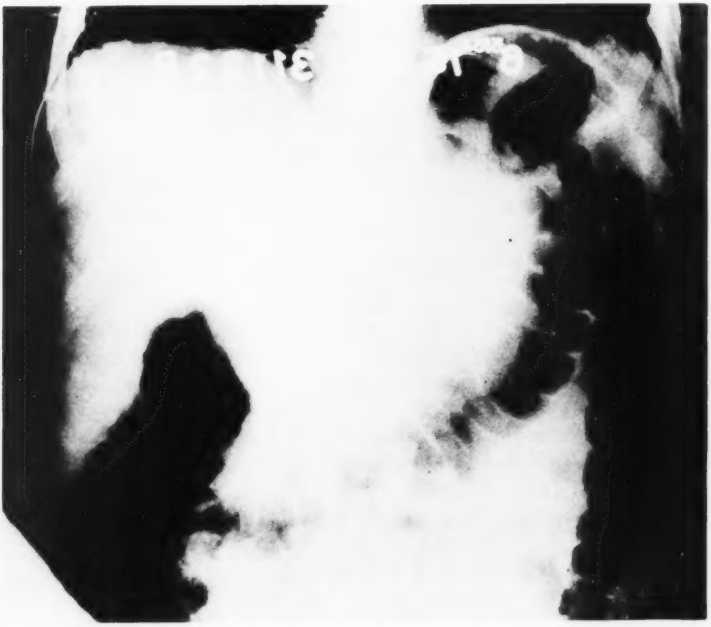

Figure 1. Epigastric cystic mass in left lobe of liver. Posteroanterior roentgenogram taken in the standing position after ingestion of Seidlitz powder and inflation of colon with air,[4] showing right lobe of liver distinct from cystic mass in left lobe.

A few hours after the needle aspiration, the patient complained of lower substernal pain, which was relieved by elevating the head of the bed. During the next 48 hours, he had fever, tachycardia, and leukocytosis. There were anorexia and abdominal fullness, with tympany over the abdomen and tenderness of the right side of the abdomen, but no dullness to percussion and no fluid wave. At the peak of this reaction, there was some muscle resistance in the right lower quadrant. Peristalsis continued normally. The temperature course consisted of a gradual rise to 102.4° F. about 24 hours after aspiration, with gradual defervescence during the second day. Serum amylase determinations, and roentgenograms of the chest and abdomen taken with the patient in the supine and standing positions revealed no cause for this reaction. The patient appeared much less ill than would have been justified by the fever and leukocytosis, and abdominal findings were minimal. The leukocyte count on 21 June was 16,500 per cu. mm. with 95 percent granulocytes including 7 percent nonsegmented neutrophils, while the sedimentation rate rose only slightly to 18 mm. per hour (Wintrobe meth-

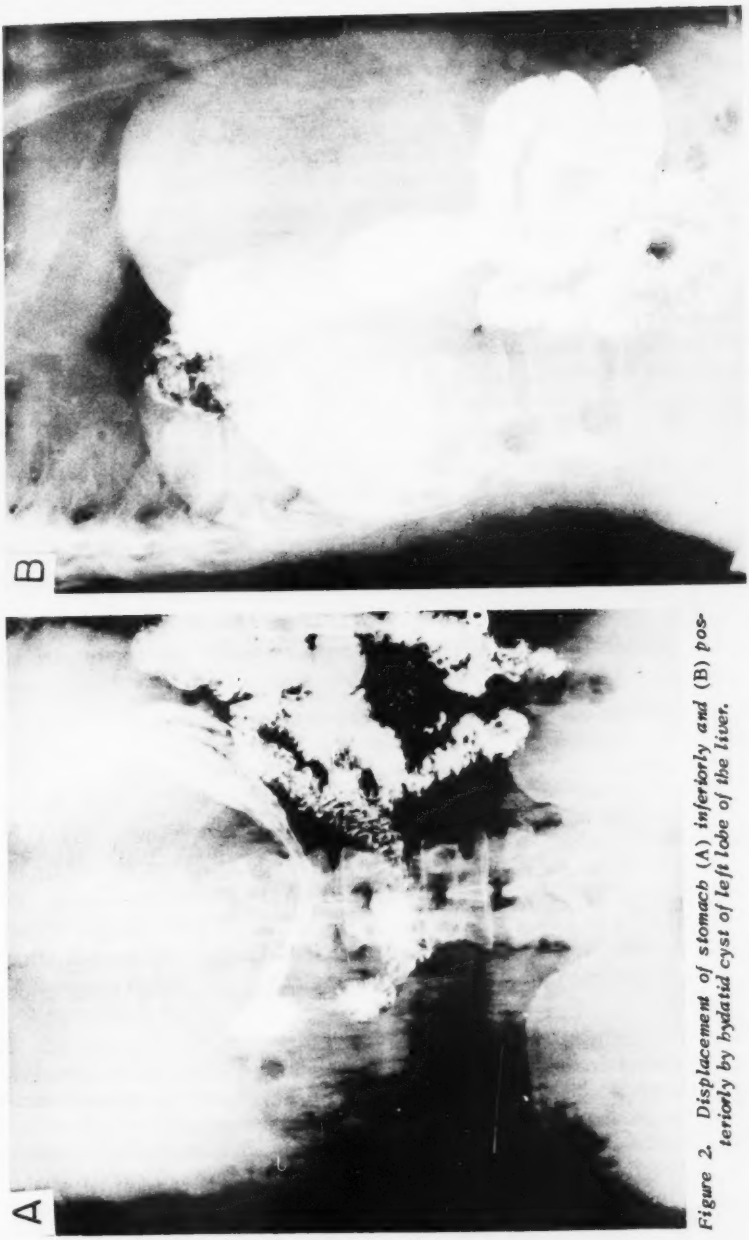

Figure 2. Displacement of stomach (A) inferiorly and (B) posteriorly by hydatid cyst of left lobe of the liver.

od). The next day, the leukocyte count had fallen to 12,500 per cu. mm. with 81 percent granulocytes, and the sedimentation rate was 23 mm. per hour. There was no change in red blood cell or hemoglobin values.

The leukocyte count was normal thereafter. However, the eosinophil percentage, which had been 1 percent on all previous blood cell counts, rose to 3 percent on 24 June, 6 percent on 27 June, 7 percent on 28 June, 10 percent on 29 and 30 June, and 15 percent on 1 July. Chamber eosinophil counts rose progressively from 490 per cu. mm. on 27 June to a peak of 1,380 on 5 July.

By 24 June, a consideration of the startling reaction to aspiration, together with the peculiar characteristics of the aspirated fluid (increased pressure, density almost of water, near absence of protein) led to the conviction that a hydatid cyst had been aspirated and that sufficient leakage to result in a reaction of hypersensitivity had occurred. The subsequently rising eosinophil counts lent further confirmation to this clinical diagnosis.

On 27 June, 0.2 ml. of Echinococcus antigen (Eli Lilly Co.) was injected intracutaneously, resulting in both immediate and delayed reactions. The former, maximal within 30 minutes, consisted of a wheal 2 cm. in diameter surrounded by erythema 4 cm. in diameter, which faded within 1 hour. The next day, an indurated erythema 4 cm. in diameter covered the area of the previous reaction. Blood drawn before administration of the skin antigen was subsequently reported by the Communicable Disease Center, U. S. Public Health Service, to give a positive complement fixation reaction with Echinococcus antigen.

The patient continued to have intermittent mild pain and tenderness in the epigastrium and right side of the abdomen, and the epigastric cystic mass rapidly recurred. Surgical exploration was performed on 8 July. At operation, performed by Drs. Joseph P. Bell and Leslie L. Saylor of this hospital, the left lobe of the liver filled the upper abdomen, and seemed completely replaced by the cyst. The area of needle aspiration was found well healed. The cyst was aspirated, partially evacuated of its germinal layer, and its contents sterilized by injection of 10 percent formalin (brand of 40 percent formaldehyde solution). It was then marsupialized to the peritoneum, and packed with gauze. It has been draining uneventfully since. Laboratory examination of fluid and the germinal layer obtained at operation demonstrated scolices and hooklets of the Echinococcus parasite (fig. 3).

In an attempt to avert the consequences of hypersensitivity reaction to spilled hydatid cyst fluid, in addition to walling off of the operative field by gauze packs, 100 mg. of hydrocortisone was administered intravenously at operation before the cyst was opened, and adrenal steroid therapy was continued during the next 2 weeks. Postoperatively, the patient's temperature and pulse rose gradually and progressively, reaching a peak temperature of 102.4° F. on the second and third postoperative days, and subsiding by lysis over the next 2 days, to be

followed by mild remittent fever for 3 additional days. Only mild leukocytosis and eosinophilia accompanied this reaction. The patient

Figure 3. Brood capsule of E. granulosus *containing six scolices, their heads invaginated; obtained from cyst fluid at operation. The brushlike booklets are plainly visualized. (× 150)*

was otherwise asymptomatic, and no cause for the febrile reaction could be found on physical or roentgenologic examination of the chest and abdomen. A slight but transient rise in serum bilirubin and cephalin-cholesterol flocculation occurred.

DISCUSSION

This case is reported primarily because of the probability of exposure to Echinococcus infection of an American soldier during World War II, and the need to alert others to the possible occurrence of other such cases. Although no other case of exposure to this disease during World War II has thus far been reported, one case of a native American soldier who apparently contracted the disease in France during World War I is on record.[5]

With the possibility of this diagnosis in mind, needle aspiration may be avoided, sparing the patient the hypersensitivity reaction which follows a leak of cyst fluid as well as possible spill

of scolices into the peritoneal cavity where they would serve as sources of new cysts. Preoperative diagnosis can be achieved if the entity is considered and the skin and complement fixation tests applied.

Treatment is surgical. If the cyst cannot be totally removed, sterilization of its contents by formalin and total removal of its germinal layer is best followed by plication of the adventitial wall to obliterate the cavity and suturing without drainage. If obliteration of the cavity cannot be accomplished, marsupialization and drainage are necessary, but drainage may continue for a prolonged period.

The use of adrenocortical steroid therapy during and following operation, as tried in this patient, may help to avoid the stormy anaphylactic reaction which usually follows the inevitable spill of cyst fluid. No other report of the use for this purpose of adrenocortical steroid therapy has been found, but antihistamine therapy has been reported to be of similar value.[6]

SUMMARY

An American veteran of World War II, presumably exposed to Echinococcus infection in North Africa in 1943 when he spent 2 months housed in a sheep barn, was found in 1955 to have a large hydatid cyst of the left lobe of the liver. Needle aspiration of the cyst, which is not advised, resulted in probable peritoneal soiling and the patient had an anaphylactic reaction. He was protected against what might otherwise have been a similar but more severe reaction by administration of adrenocortical steroids during and after operation.

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Don't despise empiric truth. Lots of things work in practice for which the laboratory has never found proof.

—Martin T. Fischer

Metastatic Adenocarcinoma of the Thyroid Gland

HOWARD W. SMITH, *Captain, USAF (MC)*

THE posterior wall of the oropharynx is an unusual location for the presenting site of adenocarcinoma of the thyroid gland. A careful search of the literature failed to reveal a previously reported case. This case is reported to emphasize the possibility of finding thyroid tissue in pharyngeal biopsies and to stress the differential diagnosis when a mass is present near the path of embryonic migration of the thyroid gland.

The differential diagnosis of tumors in the pharynx include: acute and chronic infection, granulomatous processes, vascular lesions, embryonic rests, and benign and malignant tumors.

CASE REPORT

A 24-year-old airman reported to the ear, nose, and throat clinic at this base on 24 June 1955 to have his right tonsil removed.

Present illness. The patient was well until 18 months prior to admission, at which time he noted a small swelling in his throat about the size of a 25-cent piece. The swelling was sore for only a few days. He soon became adjusted to the presence of the small mass and did not seek treatment at that time. Nine months prior to admission the patient again experienced soreness in the area of swelling and reported to the infirmary on routine sick call. He was said to have "tonsillitis" and received penicillin injections for 4 days. The soreness in his throat disappeared for about 2 weeks and then gradually returned. Six months prior to admission he noticed a swelling in the right side of his neck for the first time. He had his shirt collar made a half size larger, but it still remained too tight. Three days prior to admission the patient reported to the ear, nose, and throat clinic to arrange for removal of his "right tonsil," which was gradually making talking and swallowing more difficult.

Past history. The patient's health in the past had been excellent. He had had the usual childhood diseases but no history of mumps, scarlet fever, or rheumatic fever. The patient had experienced no adult infectious diseases. Both tonsils had been removed at the age of 13 years because of recurrent attacks of tonsillitis.

From U. S. Air Force Infirmary (MATS), Andrews Air Force Base, Washington, D. C.

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He reported a weight of 181 pounds and gain of approximately 15 pounds in the preceding year. There was no family history of cancer, or endocrine disorders.

Physical examination. On admission the patient's temperature was 99° F.; the pulse, 90; and the respirations, 16. The blood pressure was 130 systolic, 80 diastolic. He was a well-developed, well-nourished young man in no distress. His voice was somewhat muffled as though his soft palate were defective. The nasal septum was deviated to the right with only slight reduction of air passage on that side. There was a mass in the oropharynx occluding the whole right side (fig. 1). The convexity of the mass was directed anteriorly with a distinct fold be-

Figure 1. There is a mass on the right posterior pharyngeal wall, extending from the left side of the uvula to the right lateral wall of the pharynx, completely filling the right oropharynx.

tween it and the anterior part of the right pharyngeal wall. The mass had pushed the pharyngopalatinus and glossopalatinus muscles forward on the right side. There was no fullness or displacement of the soft palate although the mass extended up to touch its inferior border. The mucosa was of normal color and consistency over the mass and not adherent to it. The mass was firm, nonmovable, nontender, nonfluctuant, and did not pulsate. A soft, movable, nontender node 1 cm. long was palpated anterior to the right sternomastoid muscle at the angle of the jaw. There was a 2-cm., soft, movable node above the middle third of the right clavicle posterior to the sternomastoid muscle. A 3-cm., soft, movable node was felt anterior to the right sternomastoid muscle at

approximately the outer edge of the right lobe of the thyroid gland. The thyroid gland did not appear to be enlarged and no definite masses were palpable. There were no physical findings suggestive of endocrine dysfunction. The remainder of the physical examination was essentially negative.

Laboratory data and diagnostic studies. Urinalysis was negative. Examination of the blood revealed a hemoglobin of 13 grams per 100 ml. and a white blood cell count of 6,200 per cu. mm. with a differential count of 60 percent neutrophils, 36 percent lymphocytes, 2 percent monocytes, and 2 percent eosinophils. The red blood cell count was 4,350,000 per cu. mm. with a normal smear. The hematocrit was 40 ml. per 100 ml. The sedimentation rate was normal. Roentgenograms of the skull, sinuses, pelvis, and cervical, dorsal, and lumbar vertebrae were indeterminate for metastases. A barium examination of the esophagus was negative.

Nasopharyngoscopy revealed a mass in the lower part of the nasopharynx on the posterior wall, extending from the midline of the pharynx to the right pharyngeal wall, pushing it laterally, and also extending superiorly to a point just below the right eustachian tube orifice. The mucosa overlying the mass in this area appeared normal.

Direct laryngoscopy revealed that the mass extended inferiorly on the posterior and lateral pharyngeal walls to a level slightly above the epiglottis. Its surface there was smooth throughout with no changes in the mucosa. The tongue in this area was normal.

A biopsy specimen of the pharyngeal mass was obtained after a vertical incision about three fourths of an inch long was made through the mucosa and subcutaneous tissue overlying the mass. Fibers of the superior constrictor muscle were separated horizontally to reveal a white, glistening, firm, nonfluctuant, nonpulsatile mass lying on the prevertebral fascia. The wedge of tissue removed from this encapsulated mass appeared to be reddish brown in color, friable, and extremely vascular.

Multiple sections through the biopsy specimen revealed innumerable normal-appearing thyroid acini filled with dense acidophilic colloid. Between the acini there was a homogeneous connective tissue stroma.

Hospital course. Following diagnostic studies at the base infirmary the patient was referred to a general hospital for tracer studies and surgical care. Scintillograms in the right lateral position revealed slight uptake of radioactive iodine (I^{131}) at the angle of the jaw. There was normal uptake and a relatively normal distribution throughout the thyroid gland. A radical neck dissection and total thyroidectomy were subsequently performed. The neck nodes were examined and found to resemble normal thyroid tissue. A small nodule was found in the right lobe of the thyroid gland.

DISCUSSION

It was surprising to find thyroid tissue on the posterior pharyngeal wall as the presenting lesion in thyroid carcinoma. Moreover, close association of the lesion with the right pharyngeal wall at the approximate level of the base of the tongue was of additional interest. Lingual thyroid has been seen many times since Hunt first reported it in 1866.[1] It has been estimated to occur in 1 out of 2,500 to 4,000 instances of all types of thyroid disease.[2] When the gland fails to descend; normal thyroid tissue may be found anywhere between the foramen cecum and the normal location of the gland.[3]

Because many thyroid malignancies differentiate so highly and simulate normal thyroid tissue, Cohen and Moore[4] believed that it was extremely difficult to make a definitive diagnosis when the tissue biopsied was found along the route of embryonic migration. Zaslow and associates[5] stressed the value of using radioactive iodine to determine the location of a thyroid gland in the lingual position. Nevertheless, from 15 to 20 percent of well differentiated thyroid malignancies will take up significant amounts of I^{131}.[6]

Distribution of metastases as reported by investigators[7,8] show predilection for the lungs and bone. In Cohen and Moore's series of 101 cases of carcinoma of the thyroid gland, 1 patient was found to have metastases in the tonsil area; the majority of such patients, however, had a chief complaint of swelling in the neck.

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The big problems of medicine will be solved by young men. Young men always do it. They are uneducated and therefore unprejudiced.—Martin T. Fischer

The Flap Operation for Elongating the Ureter

EVAN L. LEWIS, *Major, MC, USA*
RICHARD W. CLETSOWAY, *Captain, MC, USA*

THERE HAVE been few reports in the literature on use of bladder and renal pelvis flaps for elongating the ureter.[1-3] The following two cases are presented to demonstrate the value of these procedures.

CASE REPORTS

Case 1. A 23-year-old man was admitted to this hospital 30 June 1953 with pain in the left flank. The retrograde urogram (fig. 1) revealed marked dilatation of the left pelvis with obstruction at the ureteropelvic junction. A Foley "Y" pyeloplasty was performed on the left side on 18 July. When the nephrostomy tube was removed, the wound did not heal and attempts to pass a catheter from below met with failure.

On 3 September a re-exploration disclosed a 4-cm. gap between the pelvis and the ureter. It was impossible to mobilize the ureter sufficiently to anastomose it to the pelvis without tension. Because the pelvis was dilated a segment, 5-cm. long and 2-cm. wide, was removed from its medial border to form a tube flap, with the base at the lowest portion of the pelvis. An end-to-end anastomosis was made between the tube flap and the ureter over a No. 16 French polyvinylite tube. A nephrostomy tube was placed in the kidney, and the wound was closed with drainage tube in place. The splint was left in place for 3 weeks. The nephrostomy tube was removed, and the ureter dilated until it accepted a No. 12 French bulb without difficulty. An intravenous pyelogram revealed good function, although there was still some dilatation of the minor calices, and a retrograde urogram on 5 May 1954 showed absence of obstruction at the ureteropelvic junction (fig. 2). The patient has remained asymptomatic and the urine is sterile.

Case 2. A radical hysterectomy for fibrosarcoma of the uterus was performed on this 45-year-old woman at this hospital in June 1954. About 1 month later there was urinary leakage from her vagina, and a diagnosis of ureterovaginal fistula was made at another hospital (fig. 3). An indwelling No. 7 French ureteral catheter was inserted in the left ureter (fig. 4) and the leakage stopped. However, an intravenous pyelogram revealed no function in the left kidney, and further attempts at

From Tokyo Army Hospital, Japan.

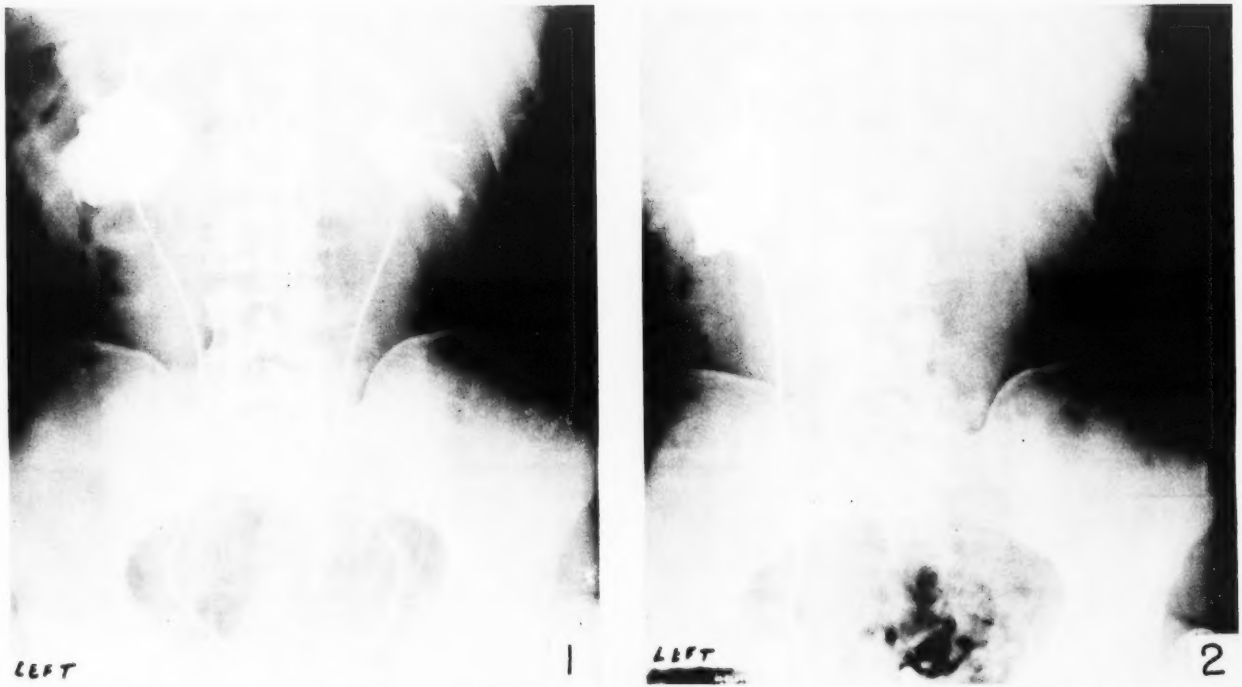

Figure 1 (case 1). Preoperative retrograde urogram showing dilatation of the left kidney pelvis and obstruction at the ureteropelvic junction. Figure 2 (case 1). Retrograde urogram on 5 May 1954 showing absence of obstruction at the ureteropelvic junction.

Figure 3 (case 2). Retrograde urogram on 13 July 1954 showing area of extravasation.

catheterization of the ureter met with failure. The patient was transferred back to this hospital on 30 August 1954. A repeat intravenous pyelogram (fig. 5) confirmed the diagnosis of complete blockage of the left ureter with absence of renal function on the left. The urine contained 3 to 5 red blood cells and 30 to 40 white blood cells per high power field, and monilia organisms were found on culture.

On 2 September 1954 the left ureter was explored. The pelvic portion was found embedded in dense scar tissue, with loss of normal characteristics. The normal portion was resected as low as possible, leaving a gap of about 3 inches to the bladder. Starting on the right wall, a section of bladder, about 2 cm. in width and 8 cm. in length, with the base on the upper left portion of the bladder, was resected. There was some shrinkage of the flap. The bladder was closed with cystostomy drainage. The flap was rolled into a tube and sutured with No. 00 chromic

Figure 4 (case 2). Preoperative retrograde urogram on 28 July 1954.

Figure 5 (case 2). Intravenous pyelogram on 31 August 1954 showing nonfunctioning left kidney.

28 July 1954.

showing nonfunctioning left kidney.

Figure 6 (case 2). Postoperative retrograde urogram.

Figure 7 (case 2). Cystogram demonstrating nipple without ureteral reflux.

catgut. An end-to-end anastomosis was made with the ureter over a No. 16 polyvinylite tube, which was brought out with the cystostomy tube.

The splint was left in place 3 weeks, after which the ureter was dilated several times with a No. 12 French catheter. A retrograde pyelogram on 4 October (fig. 6) showed that the pelvis of the left kidney had returned to normal size. A cystogram revealed about 2 cm. of reflux up the pedicle flap (fig. 7). An intravenous pyelogram also in October revealed a normally functioning kidney with no evidence of hydronephrosis. The urine remained sterile and the patient asymptomatic.

DISCUSSION

When tissue is needed to elongate the ureter at either of its ends, we recommend the use of urinary pelvis or bladder tissue. The advantages are good blood supply, use of tissue similar to the ureter, and simplicity of operation. We left the splinting catheter in place for 3 weeks, but believe healing will be better if this time is prolonged to 4 or 5 weeks.

We did not use nephrostomy tube drainage in case 2. No attempt was made at any time to obtain a watertight closure. We believe that it is best to use the minimal number of sutures to obtain approximation without tension.

It has been stated that as much as two thirds of the ureter can be replaced by bladder flaps. The amount that can be replaced at the upper end depends on the size of the renal pelvis.

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SURGERY IN GENERAL PRACTICE

"The intern who is contemplating general practice would be well advised to concentrate on medicine, paediatrics, and obstetrics and gynaecology, in that order. Contrary to popular belief, patients requiring major or minor surgery constitute less than 3% of those seen by a G. P. In a temperate climate such as ours, otolaryngology occupies more of his time (about 5½%) and should receive attention accordingly."

—H. G. HALL, M. D.
in *Canadian Medical Association Journal*
p. 91, July 15, 1955

Myocarditis in Acute Poliomyelitis

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DAVID B. CARMICHAEL, *Lieutenant Commander (MC) USN*

FOR many years the pathologist has been aware of acute myocarditis as a complication of acute poliomyelitis. Myocardial involvement consisting of cloudy swelling of the muscle fibers and interstitial edema was noted in five of six cases of acute poliomyelitis reported by Robertson and Chesley[1] in 1910. In 1918, Abramson[2] reported evidence of myocardial inflammation in a pathologic report on 43 cases of acute poliomyelitis. In 1934, Cowie and associates[3] reported four cases of myocarditis associated with fatal poliomyelitis. In one of these patients, the myocarditis was localized in the right atrium with a mural thrombus at the site and resultant pulmonary embolization. In 1942, Saphir and Wile[4] described seven cases of poliomyelitis in which histologic evidence of interstitial myocarditis was present, and identified myocarditis as a feature of poliomyelitis. Saphir[5] subsequently reported 10 cases of myocarditis found at autopsy in a series of 17 patients dying of poliomyelitis, and suggested this as a cause of sudden death in this disease. An unusual case of acute poliomyelitis and verrucous endocarditis involving the mitral valve, for which no rheumatic or bacterial cause could be identified, was reported in 1946.[6] A review of the postmortem findings in 35 patients revealed evidence of myocarditis in 14.[7] It is of interest that in this series there was one case of myocarditis with perforation of the posterior wall of the right atrium, one case of verrucous endocarditis involving the mitral valve without evidence of rheumatic fever, and one case of endarteritis of a patent ductus arteriosus. Minimal valvular changes with and without myocarditis were found almost constantly in this series. These consisted of separation of the valvular stroma as if by edema, and eosinophilic bundles of collagen fibers that were more marked in the aortic and mitral valves. Jungeblut and Edwards[8] isolated the poliomyelitis virus from the hearts of three patients dying of poliomyelitis.

Electrocardiographers have also been aware of the myocardial aspects of this disease. Electrocardiograms in a series of 226 patients with acute poliomyelitis were reported to be abnormal in 32 (14.2 percent).[9] The frequency of abnormal tracings was found to increase with the severity of the disease and with the increase in the duration of the fever. When abnormal tracings occurred it was observed that changes persisted for several weeks.

From U. S. Naval Hospital, San Diego, Calif.

In a recent group of 265 patients with poliomyelitis, abnormal electrocardiograms were found in 37 percent; it was further noted that in those with bulbar involvement 50 percent of the tracings were abnormal.[10] In a review of 49 cases occurring from 1942 to 1951,[11] myocarditis was found in 55.3 percent, and it was further noted that the incidence and severity was greater in certain epidemics, the fatal cases in 1949 having an incidence of myocarditis of 100 percent. Because of this, it was suggested that specific strains of poliomyelitis virus may be viscerotropic.

Clinical correlation with these findings has been more difficult to evaluate. As has been mentioned above, Saphir hypothesized myocarditis as a cause for sudden death in this disease, and Dolgopol and Dragan[12] reported that several patients with poliomyelitis dying of heart failure showed the findings of acute myocarditis at autopsy. Recognition of this complication at the clinical level has been a recent innovation. In general, although myocarditis in acute poliomyelitis, and more especially in bulbar poliomyelitis, is now a well-recognized pathologic entity, clinical attention has not been directed to the frequency of cardiac involvement in the disease complex. In some current texts of internal medicine this manifestation of the disease is omitted or mentioned only briefly.

Because of the serious neurologic involvement in poliomyelitis, the diagnosis of myocarditis may be extremely difficult to make. Dyspnea, cyanosis, and tachycardia are of little value in the differential diagnosis; in one reported comparative series they occurred with equal frequency in those with or without myocardial involvement.[7] Occasionally with severe myocarditis, bradycardia may occur and may be a useful diagnostic sign. Nevertheless, in the diagnosis great dependence must be placed on electrocardiographic analysis.

A comprehensive review of the electrocardiographic changes associated with acute myocarditis is beyond the scope of this presentation. No specific pattern is universally indicative of myocarditis, although certain diseases may characteristically present one or another abnormality with unusual frequency, *e. g.*, first degree AV block in acute rheumatic myocarditis. At this time, no such predilection has been demonstrated in myocarditis associated with poliomyelitis. Criteria for electrocardiographic abnormality have been described by several examiners.[13–15] Tachycardia, T-wave changes, and prolongation of the Q-T interval have been considered to be the most frequent alterations.[15] RS-T segment shifts, arrhythmias, and conduction defects are also found. Gittleman and associates[16] have stressed Q-T prolongation as a useful sign, particularly in the forms of myocarditis not associated with rheumatic fever.

Reviews totaling 905 cases of acute poliomyelitis revealed electrocardiographic evidence supportive of myocarditis in 310 cases, an incidence of 34.2 percent.[9,11,15,17-19] Reubi and Bornstein[19] noted an increased incidence of myocarditis in severe cases of poliomyelitis, equaling 80 percent in severe cases, 36 percent in mild cases, and 18 percent in abortive forms. As noted above, the incidence in the bulbar form has been particularly high.

CASE REPORTS

An instance of myocarditis, suspected clinically and confirmed electrocardiographically, in a patient with severe bulbospinal poliomyelitis is the subject of the first case report.

Case 1. A 35-year-old man was admitted to the hospital on 23 July 1954 complaining of difficulty in swallowing and talking. The history revealed that he had been apparently well until 2 days prior to admission when he noted the onset of difficulty in swallowing and inability to expectorate accumulated pharyngeal secretions. On the day prior to admission he vomited several times, and noted recurrent nausea and mild malaise. He also found that he was unable to speak as strongly as previously and that his swallowing difficulties had increased. The past history revealed that he had had rheumatic fever in 1943, apparently without sequelae.

The physical examination on admission revealed the blood pressure to be 150/70 mm. Hg; temperature, 104.8° F. (rectally); and the pulse, 120. The patient had marked difficulty in disposing of pharyngeal secretions and difficulty in maintaining an airway. The voice was somewhat weak. No difficulty in respiration nor weakness of the extremities was apparent. Reflexes were slightly hyperactive in the upper extremities but otherwise were normal. Laboratory studies, including the serologic test and chest roentgenogram, were essentially normal. Spinal fluid studies revealed a fairly clear spinal fluid with 100 white blood cells per cu. mm., of which 64 percent were lymphocytes. Treatment consisted of tracheotomy and intratracheal suction as necessary, maintenance of fluid and electrolyte balance, and terramycin (brand of oxytetracycline) for control of infection. Feedings were accomplished with an intragastric tube. Because of the development of respiratory insufficiency, he was placed in a Drinker respirator and respirations were adequately controlled.

The patient appeared to be improving until 2 weeks after admission when he developed a low-grade fever, became quite apprehensive and restless, and developed a persistent tachycardia of 120 per min. The apical first heart tone was of poor quality but otherwise no clinical abnormalities were elicited. An electrocardiogram at this time revealed a sinus tachycardia, prolongation of the Q-T interval, and inversion of multiple T waves (fig. 1).

He was treated with sedation, oxygen, and careful nursing care. During this period he developed a right facial weakness, weakness of both lower extremities with foot drop on the right, and slight weakness of both arms. The evidence of myocarditis cleared spontaneously over a period of several weeks, and the electrocardiogram reverted to normal. Rehabilitative measures consisted of physiotherapy and tube feeding for a persistent pharyngeal paralysis.

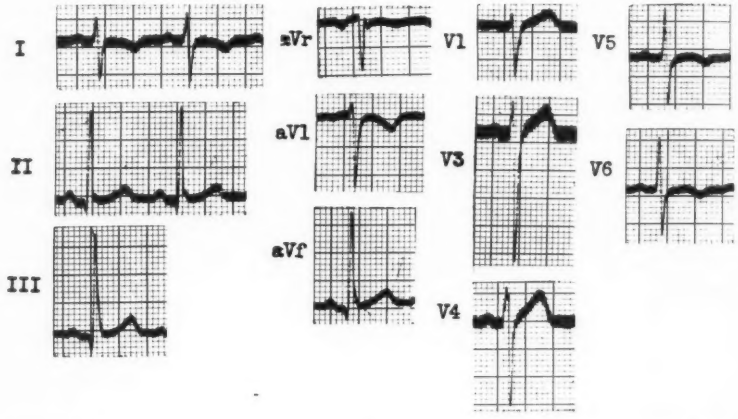

Figure 1 (case 1). Electrocardiogram of 18 August 1954 reveals prolongation of the Q-T interval and inversion of T waves in leads I, aVL, V_5, and V_6.

By virtue of the systemic effects of the poliomyelitic infection, coupled with severe neurologic involvement, the usual clinical guideposts for the diagnosis of acute myocarditis, *i. e.*, fever, tachycardia, poor cardiac tones, gallop rhythm, cyanosis, fall in blood pressure, may be difficult to separate. Conversely it is possible for the cardiac abnormalities to dominate the clinical picture and relatively minor neurologic involvement to go unrecognized. A report by Brody and associates[20] of a case of interstitial myocarditis complicating clinically unsuspected poliomyelitis represents such a situation. In this instance a patient with severe tracheal bronchitis and evidence of myocarditis was admitted, pursued a rapidly unfavorable course, and died 20 hours after admission. Autopsy revealed an interstitial myocarditis that was presumed to be the cause of death; however, a review of the pathologic material some months later revealed bulbar poliomyelitis. The following case represents a similar circumstance.

Case 2. A 23-year-old woman entered the hospital on the advice of the prenatal clinic because of exertional dyspnea for 1 week and dyspnea at rest for 2 days. The patient stated that at the age of 12 she had had migratory polyarthritis that was diagnosed as symptomatic of rheumatic fever; she had been treated with 6 months' bed rest and subse-

quently placed on limited activity at school. Findings of repeated examinations since that time had been normal. No murmurs or electrocardiographic abnormalities had been noted. There was no history of previous cyanosis or dyspnea. Two weeks prior to admission she had had a "cold" associated with a stuffy nose and some difficulty in breathing. One week before she had noticed considerable exertional dyspnea. She described this as difficulty in getting a deep breath. Her dyspnea was not affected by change of position.

Admission examination revealed a well-developed, well-nourished woman in obvious respiratory distress with shallow, rapid breathing. The blood pressure was 110/80 mm. Hg; pulse, 120; and temperature, 99° F. The skin was pallid and slightly cyanotic. No distension of the neck veins was observed. The lungs were clear to auscultation and percussion. Cardiac examination revealed a tachycardia of 120 per min., with an apical first heart sound of poor quality. No murmurs or friction rubs were heard. The heart did not appear to be enlarged. A determination of circulation time was done. Arm-to-tongue was 25 seconds, and arm-to-lung, 6 seconds. The venous pressure was 110/mm. of water. Vital capacity determinations were 35 percent and 41 percent of normal. Electrocardiograms taken the second and third hospital days are reproduced (fig. 2). Abdominal examination revealed an enlarged uterus near term with possible hydramnios and active fetal movements. A roentgenogram of the chest showed the heart to appear enlarged to both the right and left. Laboratory studies, including a complete blood cell count and total protein, serum sodium and potassium, nonprotein nitrogen, and blood urea nitrogen determinations, were normal. The CO_2 combining power was reported as 13.5 and 14.5 mEq. per liter on two separate occasions. Chlorides, as NaCl, were 85 mEq. per liter and the blood pH was 7.2. During the day the patient became more cyanotic and nauseated, and was placed in an oxygen tent. On the following day, a repeat arm-to-lung circulation time was 18 seconds and the vital capacity was recorded as 53 percent of normal. At about 1500 hours she delivered twins of normal appearance. She continued to be dyspneic and cyanotic, and 6 hours later the pulse rose to 130-135 per min. and became irregular at the wrist. The electrocardiogram showed a right bundle branch block, S-wave type, in addition to tachycardia (fig. 2). Cheyne-Stokes respirations were observed. The lungs remained clear and there was no evidence of congestive failure. No cardiac murmurs or friction rubs were heard. The possibility of a nonspecific myocarditis was entertained at this time.

About 3 hours later the patient suddenly sat up in bed and complained of being extremely short of breath. She became cyanotic, gasped for air, and within a moment her respirations ceased. Autopsy findings revealed a nonspecific myocarditis, which was considered to be the primary cause of death. Later, examination of recut sections from the bulbopontine area of the brain revealed findings which were compatible with acute bulbar poliomyelitis. There were marked edema and hyperemia of

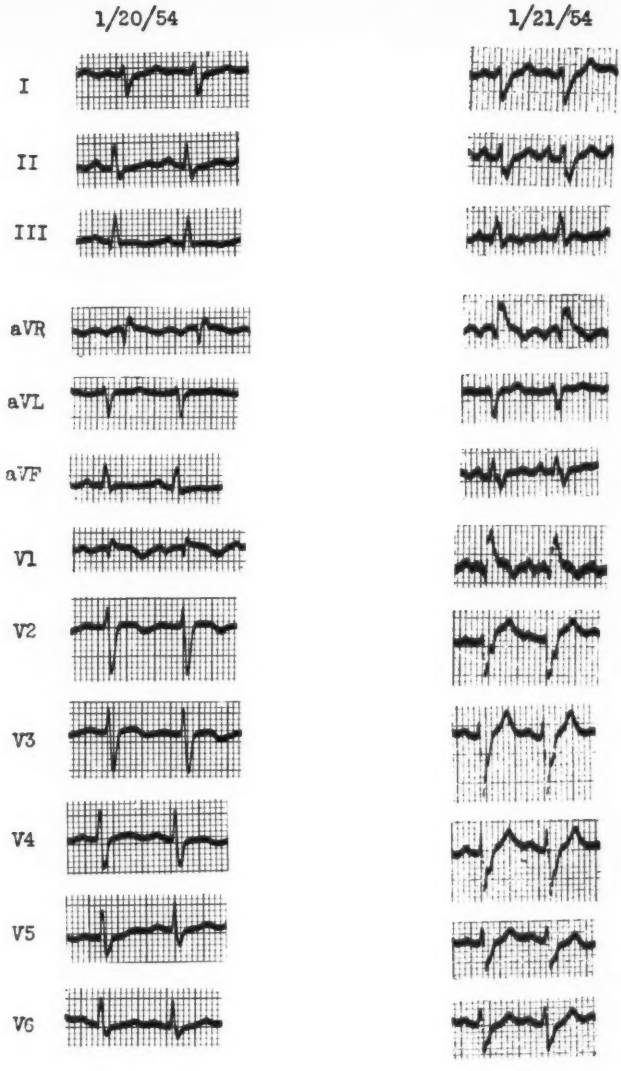

Figure 2 (case 2). Electrocardiogram of 20 January 1954 shows sinus tachycardia, right axis deviation, low ventricular voltage, inversion of multiple T waves, and prolongation of the Q-T interval. Electrocardiogram of 21 January demonstrates the development of right bundle branch block.

the glial stroma with dilatation of the blood vessels and stuffing of the perivascular spaces by polymorphonuclear leukocytes and lymphocytes.

Many of the ganglion cells were degenerated, with disappearance of the nuclei and extensive chromatolysis.

These two cases prompted a review of the hospital records of cases of bulbospinal poliomyelitis. Adequate pathologic information was available on 15 cases covering the period from 1948 through 1953. Myocarditis of varying degree was present in 14 of these cases. One case of cardiac arrest in bulbar poliomyelitis with subsequent thoracotomy and unsuccessful massage of the heart was included. Poliomyelitis was unsuspected clinically at the time of death. Either because of the clinical unawareness of myocarditis as a possible complication or because of the technical difficulties involved, electrocardiographic tracings were obtained in only two of the cases reviewed.

SUMMARY

Although the exact role of myocarditis per se as a fatal complication in poliomyelitis is difficult to determine, it is apparent that it is a common complication. The clinical diagnosis of myocarditis may be exceedingly difficult because of severe systemic reaction coupled with neurologic involvement. The electrocardiogram may be of significant assistance in the clinical diagnosis.

Two cases of acute myocarditis associated with poliomyelitis are presented. In the first patient the neurologic findings predominated; in the second, cardiac abnormalities obscured the presence of poliomyelitis, which was still unsuspected at the time of the patient's death.

Of 15 patients dying of bulbospinal poliomyelitis at this hospital during a 6-year period, 14 demonstrated autopsy evidence of myocarditis.

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THE GOLDEN AGE OF MEDICINE

It is hard to realize that prior to 1900 only two diseases—smallpox and scurvy—could be prevented, and that specific drugs were available for only three conditions—namely, malaria, worms, and scabies. Quinine usually cured malaria, and worms succumbed to many remedies including garlic, the odor of which was offensive even to worms . . . .

For example in 1930, 7 percent of the children admitted to Duke Hospital had diphtheria, and 4 percent were syphilitic. Now diphtheria is a rarity, and a positive serologic test for syphilis is regarded as erroneous until verified. As a result of this progress, there has been a marked shift from the treatment of medical, pediatric, and geriatric patients in hospitals to treatment on an ambulatory basis in offices and clinics. This modern teamwork between doctors, nurses, technicians, social workers, and psychologists is keeping patients well and treating them instead of their diseases.

—WILBURT C. DAVIDSON, M. D.
in *North Carolina Medical Journal*
p. 1, Jan. 1955

A MESSAGE FROM THE A. M. A.

Congress adjourned 2 August 1955, bringing to an end the First Session of the 84th Congress. Although there were 11,914 bills introduced in the session, much health and medical legislation was not acted upon and will therefore be carried over for consideration by the Second Session of the 84th Congress which will convene in January.

The American Medical Association followed the status of 404 of these bills, which had medical implications. Witnesses, representing the Association, testified on 21 separate bills before Senate and House committees. In the field of military medical affairs, there were 26 bills introduced in this last session of interest to the Association. Two public laws were enacted pertaining to military medicine. One extended the Doctor Draft Act and the other one authorized the commissioning of male nurses.

Doctor Draft Act Extension Public Law 118, 84th Congress, 29 June 1955, extends the authorization for the induction of physicians, dentists, and allied categories to 1 July 1957. It continues the $100 per month equalization pay for physicians and others to 1 July 1959. Two important changes were made in the extension of the Doctor Draft Act. First, the age limit for the call-up of special registrants was reduced from age 51 to 46. Second, the law exempts from induction special registrants, 35 years of age or older, who are or have been rejected for a commission as a medical or dental officer of the Armed Forces if such rejection was solely for physical disqualification.

Commissioning of Male Nurses Public Law 294, 84th Congress, 9 August 1955, authorizes the commissioning of male nurses and male medical specialists (dietitians, occupational and physical therapists) as reserve officers in the Army, Navy, and Air Force.

One bill, H. R. 483, which passed the House on 18 July 1955 would authorize the appointment of osteopaths as medical officers in the Army, Navy, and Air Force. Another bill passed the Senate as S. 2587 on 30 July 1955. It would authorize military status for commissioned officers of the Public Health Service in time of national emergency. At the present time military status is only authorized in time of war.

Immediately preceding the adjournment of Congress, two bills were introduced in the House and one in the Senate relating to

From the Council on National Defense of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense. —*Editor.*

medical care for dependents of military personnel. These measures were referred to the Armed Services Committees. H. R. 7792 was introduced by Chairman Vinson of the House Armed Services Committee. It is identical with S. 2720, sponsored jointly by Senators Russell and Saltonstall. These measures, drafted by the Department of Defense, would provide medical and hospital care under three general plans: (1) in military facilities, (2) in civilian facilities through a contributory health insurance program, or (3) in civilian facilities with part of the actual cost borne by the dependent.

H. R. 7806 was introduced by Congressman Price. This bill requires the use of prepaid nonprofit health insurance, civilian facilities, and civilian medical personnel to provide limited medical care to servicemen's dependents. It permits the use of military facilities only where civilian facilities or personnel are inadequate.

Other military medical bills which were not acted upon during the first session pertain to (a) the establishment of a United States Armed Forces Medical Academy, (b) repeal of examinations for medical personnel for promotion in the Armed Forces, (c) expanded medical care for retired military personnel, and (d) military credit for civilian intern training.

In addition to the military medical laws passed in the First Session of the 84th Congress, laws were enacted authorizing a national mental health survey and for research concerning air pollution control.

Mental Health Survey Public Law 182, 84th Congress, 28 July 1955 authorizes "the undertaking of nongovernmental, multidisciplinary research into and re-evaluation of all aspects of our resources, methods, and practices for diagnosing, treating, caring for, and rehabilitating the mentally ill, including research aimed at the prevention of mental illness." This measure authorizes $1,250,000 in Federal grants to finance the national survey of mental health problems. The survey would extend for three years.

Air Pollution Control Public Law 159, 84th Congress, 14 July 1955, provides for a 5-year program. This bill authorizes $25 million in grants to state and local governments, public and private institutions, and individuals for research, training, and demonstration projects in air pollution abatement.

PROMOTIONS OF OFFICERS

The following officers of the military medical services on active duty in the Army, Navy, and Air Force have recently received *temporary* promotions to the rank indicated.

Medical Corps

George L. Alexander, Jr., Lt., USN
Charles F. Aquadro, Lt., USN
William F. Bahnson, Lt., USN
John C. Barnes, Lt., USN
Frederick B. Becker, Lt. Comdr., USN
Ernest W. Beehler, Jr., Lt., USN
Owen D. Benton, Lt., USN
Joseph A. Beres, Lt., USN
James L. Berk, Lt., USN
John F. Bohlender, Brig. Gen., USA
Rapha F. Borrelli, Jr., Lt. USN
Murdock S. Bowman, Lt. Comdr., USN
Leonard H. Brandon, Lt., USN
Pembroke A. Brawner, Capt., USA
Lothar R. Candels, Lt., USN
James M. Cole, Lt. Comdr., USN
Clarence H. Conner, Capt., USA
John D. Contable, Lt., USN
John C. Country, Lt. Comdr., USN
Robert B. Crum, Lt., USN
David C. Dixon, Lt. Comdr., USN
Herbert L. Eckert, Lt., USN
Lawrence D. Egbert, Jr., Lt., USN
Lawrence K. Epple, Lt., USN
David W. Eskelson, Lt., USN
Ann C. Fred, Capt., USA
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Roy W. Holmes, Lt. Comdr., USN
Charles E. Huggins, Lt., USN
John D. Johnson, Lt., USN
Ralph T. Justinianodiaz, Lt., USN
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Lockland V. Tyler, Jr., Lt. Comdr., USN
Henry J. Waive, Lt., USN
Herbert L. Walter, Lt. Comdr., USN
Franklin P. Ward, Lt., USN

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Alan D. Watson, Lt. Comdr., USN
Robert Werman, Lt., USN
James E. Whiteside, Lt. Comdr., USN
Larry E. Williams, Lt., USN
John R. Wood, Brig. Gen., USA
Heber E. Yeagley, Lt., USN
Lloyd G. Yopp, Lt., USN
George G. Zorn, Jr., Lt. Comdr., USN

Dental Corps

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Robert Bailey, Capt., USAF
Mark Benes, Lt., USN
Marion M. Black, Jr., Lt., USN
Ray P. Bettis, Lt., USN
William L. Blackmon, Jr., Lt., USN
Joseph R. Bohacek, Lt., USN
Jeanpierr E. Bouquett, Lt., USN
Kenneth Boye, Lt., USN
Donald S. Brown, Lt., USN
Benjamin M. Brunson, III, Lt., USN
William J. Carroll, Lt., USN
Daniel V. Cherry, Lt., USN
James R. Childress, Lt., USN
William I. Conrad, Capt., USAF
Richard H. Cordes, Lt., USN
Tanell F. Dakie, Capt., USAF
Neil C. Demaree, Lt., USN
John A. Doyle, Capt., USAF
Emmett A. Eaton, Lt., USN
Edward L. Fassler, Capt., USAF
Max W. Friend, Jr., Lt., USN
Harry N. Garbett, Lt., USN
John O. Grippo, Lt., USN
Carl F. Gugino, Lt., USN
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John J. Webb, Lt., USN
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Martin J. Wieland, Lt., USN

Medical Service Corps

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Zeb G. Bell, Jr., 1st Lt., USAF
Edgar A. Blair, Col., USA
Robert L. Boardman, 1st Lt., USAF
George A. Boone, Lt., USN
Clifton W. Bovel, Lt. Col., USAF
Robert E. Brettman, 1st Lt., USAF
Thomas H. Caine, 1st Lt., USAF
Thomas A. Carilia, Col., USA
Austin E. Carlton, Capt., USA
Donald M. Cook, 1st Lt., USAF
Stephen B. Coslett, 1st Lt., USAF
Joseph E. N. Daigle, Lt., USN
Warren F. Diven, 1st Lt., USAF
Edward J. Elsasser, Lt., USN
Elwood E. Fisher, 1st Lt., USAF
Clarence V. Frey, Col., USA
Martin Gellman, Lt., USN
Neil E. Goodrich, Jr., Lt., USN
Barney O. Green, Lt., USN
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John A. Hay, 1st Lt., USAF
James H. Hazel, 1st Lt., USAF

Medical Service Corps—Continued

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Milton E. Koepke, Lt., USN
William S. Lagrange, 1st Lt., USAF
Sammy J. Long, 1st Lt., USAF
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Lowell H. McKerley, Lt., USN
Benjamin Miller, 1st Lt., USAF
Roderick L. Newland, 1st Lt., USAF
Rodman G. Pellett, 1st Lt., USAF
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John D. Pruitt, Lt., USN
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Clyde B. Segars, Lt., USN
Robert Sharp, Lt., USN
Elizabeth E. Smith, 1st Lt., USAF
James W. Steil, 1st Lt., USAF
John W. Symons, 1st Lt., USAF
Joseph C. Thompson, Col., USA
Robert E. Thompson, Lt., USN
Theodore W. Tober, Lt., USN
Duane L. Twait, 1st Lt., USAF
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Robert O. Walters, Capt., USA
William H. Wells, Lt., USN
Seymour Wexler, 1st Lt., USAF
Thomas E. Wheeler, Lt., USN
Fenner H. Whitley, Jr., Col., USA
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James F. Wood, 1st Lt., USAF

Nurse Corps

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Louise E. Andersen, Capt., USA
Blanca A. Aragones, Capt., USA
Mildred L. Barr, Capt., USA
Betty M. Bartz, Capt., USA
Anne C. Berley, Capt., USA
Christine H. Berry, Capt., USA
Ellen M. Borgenheimer, Capt., USA
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Therese M. Brown, Capt., USA
Virginia N. Bugbee, Capt., USA
Alberta V. Carlson, Capt., USA
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Corene Chapman, Capt., USA
Mary E. Cohen, Capt., USA
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Mabel H. Corbin, Capt., USA
Anne B. Cost, Capt., USA
Mary J. Daniels, Capt., USA
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Frances L. Delton, Capt., USA
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Earle Standlee, Maj. Gen., MC, USA****

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Clell J. Windham, Jr., Maj., MSC, USA
Essie M. Wilson, 1st Lt., NC, USA

*Oak Leaf Cluster.
**Awarded by the Air Force.
***Awarded by the Army.
****Award presented by Swedish Red Cross by orders of King Gustavus VI.

The names of officers of the medical services who have been awarded decorations by the United States Army, Navy, or Air Force are published in this department following receipt of information from official sources.—*Editor.*

DEATHS

ZISKIND, James Abe, Lieutenant (MC) USNR, Sheboygan, Wis.; U. S. Naval Hospital, Pensacola, Fla.; graduated in 1952 from the University of Wisconsin Medical School, Madison, Wis.; appointed a Lieutenant (jg) and ordered to active duty 8 December 1954; died 6 October 1955, age 31, at the U. S. Naval Hospital, Philadelphia, Pa., of a cerebral hemorrhage.

Reviews of Recent Books

MEDICAL EMERGENCIES, Diagnosis and Treatment, by *Francis D. Murphy*, M. D., F. A. C. P., and *five associate authors*. Foreword by *George Morris Piersol*, M. D. 5th edition. 603 pages; illustrated. F. A. Davis Co., Philadelphia, Pa., 1955.

This book, which is in its fifth edition, presents the acute conditions and medical emergencies most often encountered in the practice of medicine. Verbose discussions on the etiology and pathology of the described conditions have been avoided; while the diagnosis, differential diagnosis, and treatment of these diseases and emergencies have been emphasized. The current methods of carrying out the suggested diagnostic and therapeutic measures are described accurately and in adequate detail.

Each chapter covers acute conditions pertaining to a single system or a specific type of emergency, such as acute poisonings, and all chapters have been brought up to date in all respects. The chapters on blood dyscrasias have been rewritten, and many others have been revised. The discussion on the bacterial infections and the antibiotic drugs is current and is well presented.

This book is well written and edited. It is enthusiastically recommended to every practicing physician, but particularly to general practitioners.—*RALPH D. ROSS, Comdr. (MC) USN*

CARDIAC EMERGENCIES AND HEART FAILURE, Prevention and Treatment, by *Arthur M. Master*, M. D., *Marvin Moser*, M. D., and *Harry L. Jaffe*, M. D. 2d edition. 203 pages; 14 illustrations. Lea & Febiger, Philadelphia, Pa., 1955. Price $3.75.

This beautifully written handbook gives sufficient brief information for the prompt diagnosis and proper treatment of cardiovascular emergencies. These emergencies are common problems to the general practitioner in civilian communities and to the general practice medical officer in the Armed Forces. This book is for their use and not for the use of the trained cardiologist, except as a quick reference.

Angina pectoris, coronary insufficiency, and coronary occlusion are adequately outlined and discussed, except that the electrocardiographic diagnosis of myocardial infarction is too limited to be of much value to the nonspecialist. Syncope is discussed with a very useful chart for differential diagnosis and treatment. Rheumatic fever and rheumatic heart disease are given only a brief space, and the discussion is inadequate because the chemotherapeutic prevention and treatment of rheumatic fever is omitted. The authors tend to favor the use of ACTH and cortisone over salicylates; however, the dosage recommended is considered too low. Hypertensive encephalopathy

and crises of pheochromocytoma, dissecting aneurysm, and traumatic heart disease are covered briefly with short preferential statements of treatment.

The illustrations are adequate except for the scarcity of electrocardiograms; however, the authors do not purport to discuss electrocardiography in detail. The book is well indexed and has a most complete bibliography.

This thin, pocket-sized handbook should prove of value in the office of any general practitioner or specialist other than a cardiologist. Although the authors are conservative, they use all the newer methods that are appropriate and promise better results without increasing the risks to the patient.—*HORACE C. GIBSON, Col., MC, USA*

FLUOROSCOPY IN DIAGNOSTIC ROENTGENOLOGY, by *Otto Deutschberger,* M. D.; with an introduction by *Frank J. Borrelli,* M. D., F. A. C. R. 771 pages; 888 illustrations on 523 figures. W. B. Saunders Co., Philadelphia, Pa., 1955.

This book reveals the potentials and limitations of fluoroscopy and compiles essential knowledge on the subject into a single volume. It is unique in that it apparently is the only one written to cover this method of study in all portions of the body.

The early chapters deal with general aspects of the subject, with a description of apparatus for image amplification, and various other types of equipment. There is a workable discussion about the localization of foreign bodies with fluoroscopic methods. In the sections devoted to examination of the various regions of the body, the chest and gastrointestinal tract receive major attention and both discussions make for very worth-while reading. The head, spinal canal, neck, and urological tract are discussed; and there is a short final chapter on the extremities.

A large number of photographs of x-rays are included. These have been reproduced as excellent positive prints, so that one may visualize the picture as it is seen on the fluoroscopic screen. There is a long bibliography at the end of each chapter, and the index appears to be adequate.

The book is well worth reading by the student radiologist and by all who have occasion to fluoroscope the chest and abdomen.

—*CLEMENT D. BURROUGHS, Capt. (MC) USN*

SURGICAL FORUM, Proceedings of the Forum Sessions, Fortieth Clinical Congress of the American College of Surgeons, Atlantic City, N. J., November, 1954. Volume V. 851 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1955.

Those who are interested in the trends that surgery in America is following should read this annually released Surgical Forum. Wide coverage is obtained as evidenced by the 393 authors represented. The articles are all short, averaging from four to five pages, and there-

by lend themselves to a rapid, easy digestion of their contents. The illustrations are exceptionally clear and numerous, and the bibliographies brief and basic.

It is not a book that can be easily read straight through. There are 10 main divisions, under which relevant papers are grouped. This gives it a breadth of appeal to those in the surgical specialties that few volumes can claim.

One is impressed by the great amount of effort that has been focused on cardiovascular problems. About one third of the space is devoted to these papers. Much effort is still being applied to the old problems of the peptic ulcer and its many ramifications. Particularly fascinating to me are the many papers devoted to the steroids and their relationship to cancer and surgical endocrinology. The introduction to this section by Dr. Francis D. Moore is particularly stimulating.

Any surgeon involved with teaching or research should be familiar with the contents of this volume.—*MAX L. SMITH, Lt. Col., MC, USA*

OBSTETRICS, by *J. P. Greenbill,* M. D. 11th edition. 1,088 pages; 1,170 illustrations on 910 figures, 144 in color. W. B. Saunders Co., Philadelphia, Pa., 1955.

In his second revision of DeLee's classic text on obstetrics, Dr. Greenhill has combined his conservatism and perception with a wide knowledge of current literature to add much new data on many subjects, including physiology of the fetus and newborn, toxemias of pregnancy, abruptio placentae, hemorrhages associated with fibrinogen lack, puerperal infection, choriocarcinoma, asphyxia, et cetera.

There are entirely new chapters on roentgenology in obstetrics, analgesia and anesthesia, fetal erythroblastosis and the Rh factor, diseases of the nervous system, induction of labor, and prolonged labor. A special chapter on endocrine changes and diseases during pregnancy is included.

This is an excellent revision of a standard classic work which is fully abreast of obstetrical research and current advancements in technic and treatment. It is recommended as a necessity for the library of all those interested in this subject.

—*ELWOOD L. WOOLSEY, Comdr. (MC) USN*

COLD INJURY, Transactions of the Third Conference, February 22, 23, 24 and 25, 1954, Fort Churchill, Manitoba, Canada. Edited by *M. Irene Ferrer,* M. D. 226 pages; illustrated. Sponsored by the Josiah Macy, Jr. Foundation, New York, N. Y., 1955. Printed in the United States of America by Madison Printing Co., Madison, N. J. Price $4.50.

This monograph presents edited notes of discussion by conferees who are primarily interested in the physiologic and pathophysiologic effect of cold on man and experimental animals. The title of the conference is a misnomer in that there was no discussion relative to cold injury per se.

An interesting section of the monograph concerns the protein, fat, and ascorbic acid metabolism of the Eskimo. The significance of hepatomegaly commonly found in this racial group is discussed along with the findings of liver biopsies. The association of vitamin A and hepatomegaly to adaptation to cold is explored. A preliminary report is presented on a comparative study of young Eskimo and Indian males with acclimatized white males by measuring manual dexterity, skin temperatures, and blood flow during cold exposures. An attempt is made to delineate the role that ascorbic acid and subcutaneous fat play in the prevention of cold injury in man. The experimental data presented does not permit any definitive conclusion to be made.

This book should appeal to the clinical investigator and the physiologist interested in the physiologic and pathophysiologic effects of cold.—*KENNETH D. ORR, Lt. Col., MC, USA*

MAN IN A COLD ENVIRONMENT, Physiological and Pathological Effects of Exposure to Low Temperatures, by *Alan C. Burton*, Ph. D., and *Otto G. Edholm*, M. B., B. S. 273 pages; illustrated. Williams & Wilkins Co., Baltimore, Md., 1955. Price $6.75.

The second in a series published by the Physiological Society of the United Kingdom, this monograph represents the most comprehensive summary of the subject to date. For the first time, world-wide experiences with cold during World War II have been collated and presented as a most readable unit that will be interesting to both scientist and layman.

The authors introduce their subject with a novel explanation that homeothermy applies primarily to the "core" of the body. The "shell" with its temperature gradients and varying thickness plays a principal role in adaptation and acclimatization to the environment. Homeothermy is related to man's use of his clothing, home, and surrounding physical environment to extend the usefulness of his "shell." A thermodynamic description of man as an "engine" and the principles of his heat balance with the environment are described.

Three chapters are devoted to an exacting evaluation in relative units (the Clo) of the insulating property of the surrounding air as modified by wind and radiation, of the possible insulating contribution of clothing and fur, and of man's control of the thermal insulation of his peripheral tissues. Many practical examples are presented throughout and many experiences during World War II are discussed. There is a particularly excellent chapter on hypothermia and resuscitation from this state. The final chapter is perhaps the most novel for a monograph of this nature and outlines the important problems for future research on man's response to cold.

The present report is distinctive in one respect by an omission. Although it brings us up-to-date on man and on cold as we know it in in the West, in terms of modern biophysics and biochemistry we know

nothing of corresponding experiences of scientists behind the Iron Curtain. With our civilization expanding into cold areas for purposes of defense and mineral exploration, it is quite conceivable that a second monograph on this subject will not be long in forthcoming.

—*A. P. GAGGE, Col., USAF*

THE SKIN, A Clinicopathologic Treatise, by *Arthur C. Allen,* M. D. 1,048 pages; 495 full-page illustrations; frontispiece in color. The C. V. Mosby Co., St. Louis, Mo., 1954. Price $25.

A publication which correlates the clinical with the histopathologic aspects of a disease has, with few exceptions, been lacking in the field of dermatology. In this volume the author has produced a clear and concise text of this type. As one reviews this book one cannot help but appreciate the tremendous amount of work necessary for its publication.

The volume is well organized as to the contents of each chapter. Those on the so-called collagen and elastic tissue diseases, the vesicular dermatoses, the granulomas, the mycoses, the pigmentary disorders, the disorders of cutaneous appendages, the classification of skin tumors, tumors of the vessels, and the lymphomas are exceptionally thorough and complete, as to both the clinical and the histopathologic description. The chapter on nevi and malignant melanomas exceeds any other treatise on these disorders that this reviewer has ever encountered.

The book is rather bulky, but not in comparison to the tremendous amount of material presented. The advisability of including therapy in a treatise of this type might be questioned; however, relatively little space is given to this phase of the publication.

The bibliography is complete, and the index easy to use. The photography is extensive and unexcelled as to clearness of detail. In a few instances too many photographs of the same disorder were included, thus taking up space that might have been alloted to some other phase.

This book should be included in every dermatologist's library, and it will be a happy addition to the libraries of institutions giving postgraduate training in dermatology.—*JOHN H. COX, Capt. (MC) USN*

PSYCHOCUTANEOUS MEDICINE, by *Maximilian E. Obermayer,* M. D. 487 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $9.75.

The author expertly presents the theoretic and practical aspects of the concept of psychosomatic cutaneous disease, acquainting dermatologists with psychiatric views, and, perhaps more important, acquainting psychiatrists with dermatologic views. He emphasizes to both groups that the present conflict of views will be more quickly and soundly resolved if experimental research is conducted under the supervision of both specialties.

Whether or not one subscribes to the concept of neurodermatitis, he cannot help but be intrigued by the author's presentation, and while Dr. Obermayer continuously emphasizes the importance of psychic factors he does not fail to warn that other influence must receive due weight. As he says, "Nothing is more detrimental to psychocutaneous medicine than willingness to ascribe almost any inflammatory dermatosis of unknown cause to emotional tension." The reviewer agrees that such a ready escape mechanism is the great handicap of the concept of neurodermatitis.

The idea of an emotional component in such conditions as allergic eczematous contact-type dermatitis, geographic tongue, and sycosis vulgaris, may be as startling to others as it was to the reviewer. The bibliography is extensive. The work is recommended as a worthwhile basic study to all who deal with possible psychocutaneous disease.

—CHARLES D. BELL, Capt. (MC) USN

THE YEAR BOOK OF DERMATOLOGY AND SYPHILOLOGY (1954-1955 Year Book Series). Edited by *Marion B. Sulzberger*, M. D., and *Rudolf L. Baer*, M. D. 472 pages; 59 illustrations. The Year Book Publishers, Inc., Chicago, Ill., 1955. Price $6.

This Year Book contains abstracts of articles from journals received from December 1953 through November 1954. Its circulation extends to many countries, and its subject matter deals with the reporting and analysis of significant advances in international dermatology. The volume has a well-selected set of pertinent illustrations, a comprehensive subject index, and a convenient author index.

This is the 24th consecutive volume of the *Year Book of Dermatology and Syphilology* which the senior editor has helped to launch. During these years the specialty of dermatology has grown greatly in diversity, depth, scope, and stature. In addition to the value of the abstracts of international dermatologic literature and their removal of language barriers for those who cannot readily read foreign languages, two important features of this text have always had a great appeal for the reviewer: (1) The introductory chapter by the editors each year devoted to a review of some pertinent subject. This year they review some recent advances in dermatologic mycology in the fields of tinea pedis, trichophyton rubrum infections, tinea capitis, and moniliasis. (2) The analytic comments on abstracts of the literature made by the editors at the end of many reports of articles. These are of particular value because they reflect the wide experience of the editors, especially of the senior editor, an outstanding clinician, teacher, and investigator.

This volume is a valuable and useful addition to the library of every dermatologist and of every hospital with a dermatology department.

—FRANKLIN H. GRAUER, Col., MC, USA

THE THERAPY OF SKIN TUBERCULOSIS, by *Gustav Riehl*, M. D., and *Oswald Köpf*, M. D. Translated and revised by *Ernest A. Strakosch*, M. D., Ph. D. American Lecture Series, Publication Number 229, A Monograph in The Bannerstone Division of American Lectures in Dermatology. Edited by *Arthur C. Curtis*, M. D. 247 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $6.75.

This monograph is especially useful for dermatologists and other physicians treating tuberculosis of the skin. Therapy is discussed under the following topics: General supporting therapy, vitamin D therapy, antibiotic therapy, chemotherapy, tuberculin therapy, and physical and surgical therapy. Every conceivable method for the treatment of skin tuberculosis is presented in detail. The latest methods are described, including the use of vitamin D_2, streptomycin, PAS, and isonicotinic acid hydrazide. The literature is covered in an encyclopedic manner, giving more than 300 references.

The manner of approach is first a general discussion, then references to the literature and discussion of the import of the articles concerning that particular subject. This is followed by summarization of the usefulness of the drug or method used, based on the literature and the authors' experience. Although the photographs are few in number, they are clear and illustrative. This book deserves a place in the library of every dermatologist and specialist in tuberculosis.

—*LOUIS S. LELAND, Col., MC, USA*

AN ATLAS OF MUSCULOSKELETAL EXPOSURES, by *H. F. Moseley*, D. M., M. Ch. (Oxon.), F. R. C. S. (England and Canada), F. A. C. S. 235 pages; with 376 illustrations in color and 63 figures in black and white. Illustrated by *Helen T. MacArthur*, B. A., with 5 plates by *Frank Netter*, M. D. J. B. Lippincott Co., Philadelphia, Pa., 1955. Price $22.50.

This volume correlates detailed anatomy and surgical exposures of the face, upper extremity, vertebral column, and lower extremity. The standard exposures depicted are those commonly used in orthopedic procedures and the surgery of trauma, but they also are applicable to neurosurgical and plastic procedures on the parts involved.

In its field, the book is unique in that it employs to a great extent the diagrammatic use of color in an unusual method of presentation. The illustrations are arranged to show anatomic structures layer by layer, from the skeletal framework outward to the skin surface. Then, reversing the process, surgical exposures are illustrated from superficial to deep planes as viewed by the surgeon in the postured patient. Each full-page color plate is conveniently accompanied on the opposite page by an adequate descriptive text serving "to correlate the theoretical with the practical considerations and to indicate the various points in order of relative importance." In many instances, the illustration and description go beyond actual exposure to detail certain operations and the lesions involved, although the volume is not an atlas of operative procedures.

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In addition to the color plates there are simple line drawings and black and white photographs. The former illustrate the area of skin preparation required for each exposure, and the photographs show the actual posturing and successive steps in draping patients.

The section on the face includes exposures of the temporomandibular joint, the mandible, and the malar, maxillary, and nasal bones. The upper extremity section contains exposures related to the clavicle, shoulder joint, scapula, humerus, elbow joint, radius and ulna, wrist joint, and hand. Similarly, the surgical exposures of the lower extremity from hip to foot are included. In the trunk section, exposures of the vertebral column from the cervical vertebrae to the coccyx are presented, along with exposures for cervical rib and the sacro-iliac joint.

Pertinent references follow each section, and there is an adequate index. This atlas should prove valuable primarily to orthopedic and surgical residents.—*HARRY L. DEIN, Lt. Col., MC, USA*

DENTISTRY IN PUBLIC HEALTH, edited by *Walter J. Pelton*, D. D. S., M. S. P. H., and *Jacob M. Wisan*, D. D. S., M. S. P. H. 2d edition, completely revised and rewritten. 282 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1955. Price $6.50.

This edition adds five years of results concerning dental health since the first edition in 1949. The 10 excellent chapters are compiled individually by the two editors and their collaborators, each chapter selective to each author's vast background of investigation. The charts and illustrations are clearly reproduced in black and white.

Public health and statistics are synonymous in many readers' minds; however, this is not the situation presented by this book. How to interpret statistics and how to compile statistics are presented, but in most instances the dental statistics have been condensed to short, interesting facts.

Both sides of today's controversial dental problems are expertly presented. This is especially true in the chapter discussing periodontal diseases and treatment, in which the author very delicately, in a subtle presentation, permits the most biased reader to become aware of a preponderant amount of evidence to prove a conclusion for himself.

The book is useful to the military dentist responsible for large groups of dental patients. The vast number of compiled bibliographies makes this book valuable to any dentist preparing literature or investigations of a dental nature.

The primary purpose of the book is to aid in establishing dental public health courses and oral hygiene programs, as well as dental health investigations. This book should also prove of value to each practicing dentist because dental public health is each dentist's responsibility. Students of dentistry and in allied fields, such as nutrition or biochemistry, can readily benefit from this reference textbook.

HENRY B. FITCH, Lt. Col., DC, USA

PRACTICAL ORAL SURGERY, by *Henry B. Clark, Jr.*, M. D., D. D. S. 392 pages; 223 illustrations. Lea & Febiger, Philadelphia, Pa., 1955. Price $8.50.

This text is a teaching aid for the dental student, a method of continuing study for the graduate dental or medical practitioner, and a solid review for the oral surgeon. The material is well developed, beginning with basic concepts of definitions, preoperative considerations, care and management of physical facilities and instruments, and proceeds to various oral surgical and diagnostic problems. The volume ends with two excellent chapters clarifying hospital practice and the art of practice.

Clear illustrations make understandable the basic procedures, positions, and technics of exodontia and minor oral surgery. Subtitles are used in each chapter. Whenever feasible, sentence outline form is used, which adds to the usefulness of the text as an everyday working aid.

The chapters on basic oral surgical technic and postoperative care and complications are worthy of detailed study by the dentist doing exodontia, regardless of his background. The writing reflects the mature judgment of the author, and any criticism of the book must be confined to relatively minor matters. The lack of a detailed bibliography is noted, and the lack of a chapter on anesthesia is felt.

The author has produced a textbook worthy of the excellent work his group is doing in the field of oral surgery. It is a practical text without being synoptic and without overloading the student and general practitioner with too weighty a reference work.

—*CHARLES C. ALLING, Maj., DC, USA*

OPEN WIDER, PLEASE, The Story of Dentistry in Oklahoma, by *J. Stanley Clark.* 391 pages; illustrated. University of Oklahoma Press, Norman, Okla., 1955. Price $5.

This story of dentistry in Oklahoma begins with the early 1880's. The author describes its growth and development from territorial days to the present time, including the problems that arose incident to the mobilizations during the two World Wars. He also discusses the future aims and interests of dentistry in Oklahoma.

The book records in much detail the history of legislation affecting the practice of dentistry and the licensing of dentists, dental hygienists, and dental assistants; the organization, development, and activities of territorial, state, and local dental associations; and the successful search for improved standards of professional training and ethics. Hundreds of dentists who took part in these activities are mentioned, with full names, addresses, and offices held carefully recorded; and frequently with good descriptions of the individuals and the stand each took on various issues.

The book has a bibliography, an index, and 26 appendixes. The appendixes include a roster of all dentists who have been licensed in

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Oklahoma, of officers of the State Dental Association, of dental hygienists, of dental assistants, of Boards of Dental Examiners, and of Oklahoma dentists who served in the Armed Forces.

This is a book that most Oklahoma dentists will want to read and keep as the story of their profession in their state.

—*CHARLES M. FARBER, Col., DC, USA*

PRACTICAL MEDICAL MYCOLOGY, by *Edmund L. Keeney,* M. D. American Lecture Series, Publication Number 248, A Monograph in American Lectures in Internal Medicine. Edited by *Roscoe L. Pullen,* M. D., F. A. C. P. 145 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $4.50.

In an era when fungus diseases are becoming rapidly more important, this small and easily readable monograph is most timely. It is well written and presents a difficult subject in a practical, concise, factual manner. The author, an expert in his field, considers separately each of the important recognized fungus diseases in man. Historical background, geographic distribution, key clinical features, laboratory identification of etiologic agent, mycology, immunologic features, prognosis, and treatment are well presented. Two small chapters on fungus spores as allergens and on the role of poisonous fungi as a cause of mushroom poisoning and ergotism are included. The more important fungus diseases each have an excellent diagrammatic illustration, summarizing the epidemiologic, clinical, and diagnostic features and the differential diagnosis.

The organization of the book with its thorough index makes for rapid, ready reference. The bibliography includes valuable recent contributions, in addition to many classic articles dating back to the latter portion of the nineteenth century.

It is seldom that a small book of this type contains so much practical information. It admirably serves its purpose in providing understandable and concise material for the student and practitioner.

—*RICHARD I. CRONE, Col., MC, USA*

THE YEAR BOOK OF ENDOCRINOLOGY (1954-1955 Year Book Series). Edited by *Gilbert S. Gordan,* M. D., Ph. D. 392 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1955. Price $6.

This yearbook offers the usual comprehensive and excellent review of selected contributions to the current year's literature in the subject of endocrinology. The organization of the contents is basically the same as that of previous years. There are numerous illustrations to amplify the written data.

The Year Book of Endocrinology serves the important role of having in one volume well-selected and excellently summarized contributions of literature in endocrinology for the current year. Those interested in the subspecialty should have this publication in their library.

—*ANTON ZIKMUND, Capt. (MC) USN*

COLLECTED PAPERS OF THE MAYO CLINIC AND THE MAYO FOUNDATION, edited by *Richard M. Hewitt*, M. A., M. D., *A. B. Nevling*, M. D., *John R. Miner*, Sc. D., *James R. Eckman*, M. A., Ph. D., *M. Katharine Smith*, B. A., *Carl M. Gambill*, M. D., M. P. H., *Florence Schmidt*, B. S. E., and *George G. Stilwell*, M. D. Volume XLVI, 1954. 843 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1955.

The editors state that they selected the material in this collection "with the interests of the general practitioner, the general surgeon, and the diagnostician in mind," adding that "material representative of the specialties and the basic sciences" has been included "in order to present adequately the work of the Mayo Clinic and the Mayo Foundation." Six hundred and twenty-nine papers are represented. Of these, 134 are presented as abstracts or in greater detail. The inevitable result is an extremely varied selection of subjects involving most branches of the medical sciences.

The papers are grouped in sections according to anatomic systems with separate sections for radiology, physical medicine, anesthesia, and miscellaneous subjects which include, among others, one paper on fevers of unknown origin and several on technics of medical illustration.

As an obvious result of editorial policy, didactic and "review" papers predominate. Subjects of perennial and current interest are represented in writing that is interesting and lucid. Unfortunately, the original bibliographic documentation of the papers has been omitted. The volume will be of particular interest to those interested in current surgical and medical thought and practices at the Mayo Clinic.

—*JOHN K. SPITZNAGEL, Maj., MC, USA*

CIBA FOUNDATION COLLOQUIA ON ENDOCRINOLOGY, Volume VIII, The Human Adrenal Cortex, by editors for the Ciba Foundation: *G. E. W. Wolstenholme*, O. B. E., M. A., M. B., B. Ch., and *Margaret P. Cameron*, M. A., A. B. L. S., assisted by *Joan Etherington*. 665 pages; 227 illustrations. Little, Brown and Co., Boston, Mass., 1955. Price $10.

This is a report of the international symposia on the human adrenal cortex held in London in April and June 1954, the eighth in a series of conferences on endocrinology since 1949, under the auspices of the Ciba Foundation.

An outstanding group of conferees, all of them leading clinical and laboratory investigators in their several fields, presented a total of 35 papers relating to the adrenal cortex. Each paper was followed by a free discussion notable for its intimacy and informality. Penetrating questions and remarks during the discussions were freely made and honestly answered. In this volume, every aspect of the hypothalamus-pituitary-adrenal axis is exhaustively considered, from the histochemical reactions to the purely clinical features of the normal and pathologic physiology of these structures.

It is difficult and, at times, tedious reading, due to the presupposition by the authors of intimate knowledge of steroid chemistry,

experimental methodology, and complete familiarity with the world literature on the part of the reader. It is not a book for casual perusal. An extensive bibliography and a highly complete index make this work of encyclopedic value for the student of the adrenal cortex.

—*ROBERT K. MOXON, Lt. Comdr. (MC) USN*

THE HYPOPHYSEAL GROWTH HORMONE, NATURE AND ACTIONS. International Symposium sponsored by the Henry Ford Hospital and Edsel B. Ford Institute for Medical Research, Detroit, Mich., and held at the Hospital October 27, 28, 29, 1954. Editors: *Richmond W. Smith, Jr.*, M. D., *Oliver H. Gaebler*, M. D., and *C. N. H. Long*, M. D. 576 pages; illustrated. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N. Y., 1955. Price $12.

This book is the edited transcript of an international symposium; the editing of all papers and discussions having been done by the three editors rather than individual authors, in the interest of speedy publication.

The participants in the conference included most of the investigators in the world who have done or are doing significant work in this field. The data and opinions therefore constitute an authoritative and up-to-date survey of the present status of growth hormone, as well as of recent advances in knowledge and investigative technic. The papers are grouped into several general fields, with distinguished investigators who have special interest in these fields designated as discussors.

This meeting was an important research event, and the discussions were on a detailed, technical, frequently abstruse level that does not make easy reading and is of little interest to clinical practitioners. This volume is important, however, to research workers in this and allied fields, and to medical libraries as a reference work.

—*CHRISTIAN GRONBECK, Lt. Col., MC, USA*

NEUROPHARMACOLOGY, Transactions of the First Conference, 26, 27, and 28 May 1954, Princeton, N. J., edited by *Harold A. Abramson*, M. D. Sponsored by the Josiah Macy, Jr. Foundation, New York, N. Y. 210 pages; illustrated. Printed by Madison Printing Co., Madison, N. J., 1955. Price $4.25.

These published conferences devoted to special subjects in the medical field are well known for their excellence; and this one is no exception. Those who are interested in neurophysiology or neuropharmacology will find this book particularly informative. There is clear presentation of progressive research by the authorities themselves, plus interspersed comment and discussion by distinguished investigators in related and interdisciplinary fields.

This volume elucidates some of the more significant efforts in neurophysiologic research in the past few years. Appropriately, the first discussion is by Dr. Seymour S. Kety on *Considerations of the Effects of Pharmacological Agents on the Over-All Circulation and*

Metabolism of the Brain. Such matters as cerebrovascular resistance, vasospasm, oxygen, carbon dioxide, glucose, drugs, and anxiety are taken up. Dr. Ernest A. Scharrer follows with a chapter called *Functional Organization of the Brain,* in which he emphasizes the variations of cerebral blood flow and the variation of chemical characteristics in different parts of the brain.

Dr. Mary A. B. Brazier indicates in *Studies of Electrical Activity of the Brain in Relation to Anesthesia* that there are different origins or pathways for the electrical activity observed at the cortex. This is followed by Dr. Horace H. Magoun's *Ascending Reticular System and Anesthesia.* The arousal response and the effect of anesthesia on the central cephalic system are considered. Finally, Dr. Carl C. Pfeiffer presents *Observations on New Central Nervous System Convulsants.* He discusses the convulsant hydrazides and the possible site and mode of action of convulsants.

In addition to the references given at the end of each chapter, the book contains an interesting appendix: *Autobiographical Sketches of Participants.*—*ARTHUR J. LEVENS, Lt. Col., MC, USA*

SHOULD THE PATIENT KNOW THE TRUTH? A Response of Physicians, Nurses, Clergymen, and Lawyers. Edited by *Samuel Standard,* M. D., and *Helmuth Nathan,* M. D. 160 pages. Springer Publishing Co., Inc., New York, N. Y., 1955. Price $3 hard cover, $2 soft cover.

Twenty-four experienced professional people with extensive clinical experience each portray in this book the circumstances and problems arising when a diagnosis of a fatal disorder is made and the question of communicating this fact to the patient or other responsible persons becomes necessary. How much of the truth should be told, who should tell it and in what manner, and the many weighty issues involved are described in separate chapters by surgeons, internists, psychiatrists, nurses of various specialties, clergymen of different faiths, and experts in law. Each describes how every situation must be individualized. The total person must be taken into account in formulating an approach that will not only discharge the physician's responsibility by permitting the patient to know the truth in time, but that also will not aggravate his condition or prevent him from doing those last things which he needs to do.

Despite what may seem to be a morbid subject, the authors and contributors have developed practical and penetrating expositions of significant situations that could arise. The tender and deeply intuitive insight shown by contributors from the nursing profession in the cases of children and psychotics are welcome and helpful.

This practical volume should be in every physician's library, and should be required reading for students of medicine, law, ministry, and the priesthood. It is a book to be read and reread. Profound values are tactfully touched on in many of the contributors' papers, suggesting that an attitude of reverence for man and his needs is a dependable

hallmark of those best equipped to care for them. The experienced physician, the beginner, and all who care for the ill can profit from the guidance to be found in the pages of this book.

—*PAUL J. SCHRADER, Lt. Col., MC, USA*

AIRBORNE CONTAGION AND AIR HYGIENE. An Ecological Study of Droplet Infections, by *William Firth Wells.* 423 pages; illustrated. Published for The Commonwealth Fund by Harvard University Press, Cambridge, Mass., 1955. Price $6.

This monograph details the development of knowledge of air-borne contagion from coordinated and systematic research approaches over the past 20 years. It documents and synthesizes the evidence into clear principles, many of which are expressed quantitatively, and points up the real significance of sanitary ventilation in the dynamic control of air-borne contagion. Methods of purification by sanitary ventilation or by use of ultraviolet or aerosols are well described, and the practical applications developed.

Although this work is based strongly on mathematical expressions of the dynamics of contagion and air purification, it is so well organized and developed that the chapters tell a connected story and present a lucid description of air hygiene that a layman can understand. Other chapters are so complete as to satisfy any student of the biodynamics involved. The epidemiologist, or any physician faced with the problem of preventing air-borne contagion, will find this monograph a valuable reference book, illuminating his thinking about the biology, biophysics, and biochemistry of droplet nuclei infection and disinfection and the role of sanitary ventilation in controlling air-borne epidemics.

—*ROBERT W. BABIONE, Capt. (MC) USN*

SOME PHYSIOLOGICAL ASPECTS AND CONSEQUENCES OF PARASITISM, edited by *William H. Cole.* 90 pages; illustrated. Rutgers University Press, New Brunswick, N. J., 1955. Price $2.

This book consists of papers presented at the Eleventh Conference on Protein Metabolism at Rutgers University. They concern cultivation and nutrition, protein metabolism, the specific nature of enzymes of some parasitic protozoa and helminths, and antibody formation in infected hosts.

Investigations were reported by Trager, Moulder, Read, Bueding, Taliaferro, and Stauber. This group of studies represents signposts pointing in the direction of new territory yet to be conquered, (the physiology and biochemistry of parasitism), rather than fields that have been more thoroughly traversed.—*CLAY G. HUFF*

ETIOLOGY OF CHRONIC ALCOHOLISM, by *Oskar Diethelm,* M. D. 227 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $6.75.

This research monograph represents the results of a 5-year joint study by a group of physicians, physiologists, chemists, psychologists, social scientists, anthropologists, and psychiatrists. It presents the

etiology of alcoholism as a complex one with multiple, mutually dependent variable factors which may play important roles. It stresses the point that alcoholism may not be a primary disease, but a symptom of other illnesses that must be understood before proper treatment can be instituted. Proper therapy of each individual patient requires an understanding of the total personality within its biosocial and biophysical environment. The authors point out that the present studies must still be considered as initial observations and that further intensive studies of all factors are essential. The multiplicity of the factors involved indicates why no single specific treatment of alcoholism has been derived.

Excellent chapters on the "Psychopathology and Character Structure in Chronic Alcoholism" by Dr. Mary Jane Sherfey, and the "Familial and Personal Background of Chronic Alcoholics" by Dr. Manfred Bleuler, are definitely worthy of serious study by both investigators and therapists of alcoholism. The section "Biochemical Experimental Investigations of Emotions and Chronic Alcoholism" is primarily a scientific statistical presentation of biochemical factors that only the true researcher can grasp. The interesting account of "Alcoholism in the Cantonese of New York City" presents a biosocial approach relating to cultural and familial attitudes toward the use of alcohol. It fails to present any real investigation into those members of this society who may have become alcoholics.

This monograph should be recognized chiefly as a contribution to the necessary research on chronic alcoholism and should be available for persons who are sincerely interested in chronic alcoholism and the chronic alcoholic.—*LUCIO E. GATTO, Col., USAF (MC)*

RADIOISOTOPES IN BIOLOGY AND AGRICULTURE, Principles and Practice, by *C. L. Comar.* 481 pages; illustrated. McGraw-Hill Book Co., Inc., New York, N. Y., 1955. Price $9.

The stated purpose of this book is "To bring home to the student and investigator an appreciation and understanding of how radioisotopes can fit into their program and then to show how the experimental work can be undertaken." The volume is directed primarily to the biologist, and examples cited are those of interest to him. Limited portions of the book deal with medical applications.

The chapters concerning principles and basic difficulties of tracer methodology are particularly well written and will be of value to anyone interested in the general field. Throughout, the book emphasizes various problems that can be solved through the use of isotopes. The author has compiled an excellent bibliography to emphasize particular applications to certain fields of interest.

A listing is included of isotopically labeled preparations provided by the Oak Ridge National Laboratory, but for up-to-date information the investigator should refer to the catalog and price list published

by the Atomic Energy Commission. Chapters on autoradiography, paper chromatography, and ion exchange introduce the basic principles of these technics.

This book will provide a good indoctrination to the student in the field of isotopes. However, the investigator will require direct reference to the literature.—*JAMES B. HARTGERING, Lt. Col., MC, USA*

THE ROLE OF HUMORAL AGENTS IN NERVOUS ACTIVITY, by *Bruno Minz*, M. D. American Lecture Series, Publication Number 240, A Monograph in the Bannerstone Division of American Lectures in Pharmacology. Edited by *Chauncey D. Leake*, Ph. D. 230 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $7.75.

Professor Minz has written a monograph on a highly controversial subject. In some 200 pages the author, a well-known investigator in the field, has attempted to clarify some of the confused ideas about the role of humoral agents in nervous activity. He should be congratulated in his handling of delicate subject matter, which has in the last half century been filled with dreams, vague hypotheses, theories, personality clashes, and much varied experimentation. He makes an honest effort to be without bias, giving credit where credit is due but still maintaining his own integrity and beliefs.

This short text makes it possible for any busy scientist in or out of the field to obtain a panoramic view of the subject as it stands today. The reader may then feel, as the reviewer does, that the monograph is a stimulant for further research.

The book is handsomely bound, written in a personal style, easy to read, and contains figures from the original experiments. It will find a useful place in any biologic library.

—*EUGENE B. KONECCI, Capt., USAF (MSC)*

SHEARER'S MANUAL OF HUMAN DISSECTION, edited by *Charles E. Tobin*, Ph. D. 3d edition. 287 pages; 79 figures. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N. Y., 1955. Price $6.

This manual is offered to medical students as a laboratory guide, not as a textbook of anatomy, and supplemental collateral reading in one of the standard descriptive texts is recommended by the editor. For the same reason, the manual will not meet the needs of the specialist studying the detailed structure of particular organs.

Only minor changes and a few additions have been made in this third edition. The material is well organized and presented according to body regions. This permits adaptation to meet different plans of instruction. The style is concise, the directions for dissection are clear, the illustrations are adequate for their purpose, and the format, with important terms printed in bold face, is especially designed to help the student while carrying out his dissection. As a guide, this manual fulfills its mission and can be highly recommended for use by medical students.—*ARTHUR STEER, Lt. Col., MC, USA*

ANCIENT THERAPEUTIC ARTS, The Fitzpatrick Lectures delivered in 1950 and 1951 at the Royal College of Physicians, by *William Brockbank*, M. A., M. D. (Camb.) F. R. C. P. 162 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $5.

The subjects chosen for these four lectures were: enema administration, cupping and leeching, counter irritation, and intravenous methods of giving drugs. The author outlines the history of each form of treatment from its earliest recorded use; in the case of the enema, for example, from about 1500 B. C. By quotation and anecdote he adds considerable interest to the narrative, and introduces a certain amount of humor. An outstanding feature of the book are numerous illustrations from old medical texts and from objects in such great collections as the Wellcome Medical Museum, the British Museum, and the Royal College of Surgeons.

The publisher's reproduction of the illustrative material is remarkably fine, and the little book is almost a small atlas of the subjects of the lectures. Another important feature is the excellent bibliography at the end of each lecture, giving a rather extensive list of both articles and books dealing with the subject. The binding, paper, print, and even the book jacket are excellent. Most medical men and many laymen will enjoy this book and the numerous illustrations that form almost a pictorial history of these ancient therapeutic methods.

—*LOUIS H. RODDIS, Capt. (MC) USN (Ret.)*

COUNSELING IN MEDICAL GENETICS, by *Sheldon C. Reed.* 268 pages. W. B. Saunders Co., Philadelphia, Pa., 1955.

A monograph of the practical approach to problems in genetics could come from no source more qualified than the Dight Institute of Human Genetics, which has contributed so greatly to the study of hereditary diseases. This text serves a twofold purpose; first, to remind the reader of the necessity of correctly advising patients and parents on questions of heredity; and second, to provide factual information on "Counseling in Medical Genetics."

The author exhibits a comfortable style that is informative as well as interesting. This text is concisely written in an easily readable format. The more common genetic problems are discussed individually with a question and answer session at the end of each chapter. These sessions help to clarify the discussion in a brief and stimulating manner. Important information is presented by tables that deal with state laws, guidance centers, and blood grouping. The appendix presents a catalogued summary of each hereditary disease. An excellent bibliography and an accurate index complete a well-edited book.

This thesis is of definite value to anyone whose practice deals with either newborn infants or with an active obstetric service. It may be used as a desk reference for correctly advising prospective parents. However, as a genetics text, additional fundamental and theoretical discussions would be of value.—*PETER W. SCHNEIDER. Lt. Comdr. (MC) USN*

SURGICAL NURSING, by *Eldridge L. Eliason,* M. D., SC. D.; *L. Kraeer Ferguson,* M. D.; and *Lillian A. Sholtis,* R. N., M. S. 10th edition. 754 pages; 329 illustrations, including 10 subjects in color. J. B. Lippincott Co., Philadelphia, Pa., 1955. Price $4.75.

This well-written volume should serve as an excellent textbook and frame of reference on the nursing care of patients undergoing surgical treatment. It was written primarily to present to the nursing student a concept of the comprehensive nursing care needed by these patients. The authors have striven to inculcate an appreciation of the total care of the patient, based on an awareness of his social, mental, physical, and spiritual needs.

The book is divided into units, according to the functional divisions of the body. The newer advances in cardiac and chest surgery are clearly described with emphasis given to the special nursing problems encountered.

The general presentation and arrangement of the material makes for easy reading and reference. At the conclusion of each chapter, a clinical situation is presented with several related questions and possible answers. This new feature should serve as a review and consolidation of important aspects in surgical nursing care. An excellent bibliography is located at the conclusion of each unit; these are arranged by subject for easy reference.

Although written primarily for the student nurse, the text offers the instructor in surgical nursing a solid guide; it offers the professional nurse a review of the field; and it offers the subprofessional student and worker a ready reference. The authors have succeeded in contributing a worth-while, authoritative work to the nursing field.

—*RUTH L. GREENFIELD, Capt., ANC, USA*

LABORATORY EXERCISES IN ANATOMY AND PHYSIOLOGY, by *Dorothy Walton Parry,* B. A., M. A. 158 pages; illustrated. G. P. Putnam's Sons, New York, N. Y., 1955. Price $3.

This is a 162-page, practical manual prepared for the mutual benefit of student and instructor. The author has designed exercises elastic enough to cope with the needs of the exceptional as well as the average student. For the instructor, her objectives also center around two factors: shortening the time required to prepare for basic experiments, and adaptability for either a comprehensive or a less intensive course of study.

Suggested equipment and materials for experiments are simple, inexpensive, and easy to obtain. Diagrams are numerous and clear, and blank pages for student notes are conveniently placed throughout the book. Self-test questions appear at the end of each unit. Occasionally these are repetitious and vague.

Although indexes and bibliography are not included, this book will doubtlessly serve adequately as a manual for instructor and student.

—*LILLIAN B. SCHOONOVER, Lt. (NC) USN*

New Books Received

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

STUDIES IN THE FUNCTIONS AND DESIGN OF HOSPITALS. The Report of an Investigation sponsored by the *Nuffield Provincial Hospitals Trust* and the *University of Bristol.* 192 pages; illustrated. Geoffrey Cumberlege, Publisher to the University, Oxford University Press, Amen House, London E. C. 4. Distributed by Oxford University Press, Inc., New York, N. Y., 1955. Price $15.

OBSTETRICAL ROENTGENOLOGY, by *Robert Berman,* M. D., F. A. C. S. Second Volume of a Series of Monographs on Obstetrics & Gynecology, edited by *Claude E. Heaton,* M. D. 599 pages; 486 illustrations. F. A. Davis Co., Philadelphia, Pa., 1955. Price $12.50.

SALIVARY GLAND TUMORS, by *Donald E. Ross,* M. D., F. A. C. S., F. I. C. S., F. R. C. S. (Eng.), F. R. C. S. (Edin). 86 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1955. Price $7.50.

THE QUANTITATIVE ANALYSIS OF DRUGS, by *D. C. Garratt,* Ph. D. (Lond.), F. R. I. C. 2d edition. 670 pages; illustrated. Philosophical Library, Inc., New York, N. Y., 1955. Price $17.50.

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